

THE
STUDENT'S REVIEW;
OR,
EXAMINATIONS ON
THERAPEUTICS, MATERIA MEDICA,
AND
PHARMACY.

ADAPTED ESPECIALLY TO THE COURSE OF LECTURES
DELIVERED IN

THE UNIVERSITY OF PENNSYLVANIA.

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PREFACE.

The utility of a work like the present, was first impressed upon the mind of the Author, while a student at the University of Pennsylvania, in the year 1840. The inconveniencies of the United States Dispensatory, the text book of the lectures on *Materia Medica*, delivered in that institution, he found to be considerable; for while it contains a vast fund of information, so arranged as to render it valuable as a book of reference, it is too voluminous and minute on many points, to adapt it to the wants of the student. And although these inconveniencies have been greatly done away with by a syllabus of the course of lectures on that branch, published by the Professor, which was intended as a guide to the student, and to direct his investigations to those facts deemed essential to be known, yet the task of culling, thus imposed, was found to be not only tedious, but very unfavorable to the operation of memory, so that the frequent reviews which were necessary, to become familiar with important facts, required much labor and consumption of precious time. The present work is intended to

facilitate, especially, the studies of those who may attend the lectures on *Materia Medica* and *Pharmacy* in that institution. But while this is the case, and the classification of medicines peculiar to that chair has been adopted and closely followed in the succeeding pages, it is believed that the examinations on particular medicines, may be made greatly to subserve the convenience of students of other colleges.

EXAMINATIONS.

PHYSIOLOGICAL EFFECTS OF MEDICINES.

What are the objects of *Materia Medica*, Pharmacy and Therapeutics?

Materia Medica treats of medicines as they are received by the apothecary, whether they be derived from nature or furnished by the manufacturer. Pharmacy treats of preparing, preserving, compounding and dispensing medicines. And Therapeutics of their effects and applications in the cure of disease.

How may medicines be defined?

Substances which are capable, when properly used, of counteracting morbid actions and agencies.

Upon what general principles do medicines operate?

Their operation may be either vital, chemical or mechanical; and the sanative impression which they produce, either absolute or relative, primary or secondary, local or general.

By what methods are medicines thought to operate upon other and distant parts of the system from that to which they are applied, and how do they differ in their peculiar tendencies?

They may operate in three ways: 1, by absorption; 2, by nervous communication; and 3, by revulsion. They differ widely in their elective affinities, some acting by preference, on one organ, and some on others, as the stomach, bowels, kidneys, &c.; and that, too, often independent of the parts of the body to which they are applied.

CIRCUMSTANCES THAT MODIFY THE EFFECTS OF MEDICINES.

What are some of the circumstances calculated to modify the action of medicines, and which should be kept in view when we employ them and apportion their doses?

The most important modifying influences may be expected from disease, age, sex, mode of living, habit, climate, temperament, idiosyncrasies and mental emotions; these, together with the strength of the patient, the duration of the disease, the variable strength of the medicine employed, &c., should influence the dose or quantity given.

What practical rules have these circumstances originated?

Age, one of the most important of these, suggested the following excellent scheme of Dr. Young, for graduating the doses to different ages:

"For children under 12 years, the doses of most medicines must be diminished in the proportion of the age to the age, increased by 12; thus, at two years to $\frac{1}{4}$,—viz: 2

————— = $\frac{1}{4}$. At 21 the full dose may be given.
2×12

Also, the following table of Gabius:

"The dose for a person of middle age being

from 14 to 21 years will be	1 or 1 drachm,
7 to 14 " "	$\frac{2}{3}$ or 2 scruples,
4 to 7 " "	$\frac{1}{3}$ or $\frac{1}{2}$ drachm,
of 4 years, " "	$\frac{1}{3}$ or 1 scruple,
3 " " "	$\frac{1}{4}$ or 15 grains,
2 " " "	$\frac{1}{6}$ or 10 grains,
1 " " "	$\frac{1}{8}$ or 8 grains,
	$\frac{1}{12}$ or 5 grains."

These rules will be found to approximate, what in general is correct, but there are several exceptions, such as calomel and castor oil, which require to be given to children in larger proportions than the above rules would indicate.

Habit, or the protracted use of a medicine, by which, as a general rule, the susceptibility of the system to its action is diminished, is another important circumstance often requiring an augmented dose.

The *variable activity* of a medicine, is another circumstance which should be kept in view in prescribing, and whenever an active medicine has been given for some time, in large and increasing doses, it is prudent to reduce the dose on commencing with a fresh parcel, particularly when the medicine is liable, from its nature, to be of unequal strength; as *digitalis*, &c.

The powers of the system should be duly considered, and the dose of remedies accommodated to the strength of the patient. *Sex, temperament and idiosyncrasies* should influence the dose. Women require somewhat smaller doses than men, and persons of a sanguine temperament, than those of a phlegmatic.

Constitutional peculiarities or idiosyncrasies render some persons uncommonly susceptible, or insusceptible, to the action of certain medicines, requiring a modification of dose, and in some cases, prohibiting their use altogether.

FORMS IN WHICH MEDICINES ARE USED.

In what forms are medicines employed?

In the solid state, in the form of *powders, pills, troches* and *confections*; in the liquid state, in the form of mixtures and solutions, including, under the latter head, *infusions, decoctions, wines, tinctures, vinegars, syrups, honeys* and *oxymels*. They are also used externally, in the form of *liniments, ointments, cerates, cataplasms* and *plasters*, and sometimes in the state of vapor.

1.—Solid Forms.

POWDERS.—PULVERES

How are these divided?

Into *simple* and *compound*—the former consisting

of a single substance, the latter, of two or more mixed together.

What is the mode of preparing and preserving powders?

Most substances are brought to the state of powder, by means of a mortar and pestle, made either of iron, brass, glass or wedgewood—the two former used for hard substances, the two latter, for triturating those of a friable nature. The coarser particles separated by sieves made of different materials, as bolting cloth, hair cloth, gauze or wire. Earthy insoluble substances, sometimes reduced to powder by *levigation*, which is performed by moistening them with water or alcohol, and rubbing them on a hard flat stone with a muller of the same material. The powder thus obtained, may be rendered impalpable by *elutriation*, which consists in agitating it with water; allowing it to stand till the coarser particles subside; pouring off the liquid, for the finer ones to settle; and lastly, decanting and drying the powder. In the preparation of compound powders, the constituents, when of unequal hardness, should be pulverized separately, and afterwards mixed, except in those cases where a hard substance is used to effect a more minute division and thorough intermixture of other ingredients, as sulphate of potassa in the preparation of Dover's powder. Some medicines are liable to be injured by exposure to air and light, and as the liability is increased by pulverization, which exposes a more extended surface to their action, such substances should be pulverized only in small quantities, as needed, or if kept, should be preserved in well stopped bottles, in dark places.

For what substances is this form eligible and ineligible?

It is preferable for those medicines which are not given in very large doses, not exceeding ʒj., which possess no corrosive property nor very disagreeable taste. Deliquescent substances and those containing a large proportion of fixed oil, are unfit to enter into

the composition of powders; as also, some crystalline salts, which contain a large proportion of water of crystallization. This, however, may be previously driven off, in some cases, by the application of heat.

How are they administered?

Light vegetable powders are given suspended in water, wine or other convenient liquid; heavy resinous and metallic ones, in syrup, honey or molasses. Resinous powders may be given, also, suspended in water, by the intervention of mucilage or sugar.

PILLS.—PILULÆ.

What are pills and their advantages, in prescription?

They are small masses, of a globular shape, and of a size suitable for swallowing; an eligible form for administering medicines which operate in small doses, are unpleasant to the taste and smell, and are insoluble and too heavy to be suspended in aqueous vehicles.

What substances are unsuitable for pills?

1. Those which require to be given in very large doses. 2. Deliquescent and efflorescent salts; the latter may be rendered fit, by depriving them of their water of crystallization. 3. Substances requiring a large proportion of dry powder to impart proper consistence, as oils. And 4. Such as from their insoluble nature in the solid form, resist the solvent powers of the gastric juice.

What are the directions for the preparation and preservation of pills?

The substance to be formed into pills, should be first made into a plastic mass of sufficient consistence to retain the globular form, when made into pills, without being so hard as to tax the solvent powers of the stomach. Many substances are employed to impart the requisite softness and plasticity to pilular masses; liquids and very soft substances are brought to this state by being mixed with some dry and inert powder, as crumb of bread, wheat flour, starch, or

powdered gum arabic ; heavy metallic powders, with soft extracts, confections, soap, &c. ; and light vegetable powders, with syrup, molasses, honey or mucilage, or what is better, a mixture of syrup and mucilage. Some substances require only the addition of water or a few drops of spirit, as some vegetable extracts, and certain gum-resins. The mass is formed into pills by rolling it with a spatula into a cylinder of uniform thickness, and dividing it by the hand or by a machine, and rolling the pieces between the fingers, to give them the proper form. To prevent them from adhering to each other, they may be agitated with some dry powder, as powdered liquorice root, starch or carbonate of magnesia ; care being taken not to employ any substance, either for this purpose or in their composition, which is incompatible with the active ingredients of the pills. Pills are sometimes covered with gelatin, to conceal their disagreeable taste. (See U. S. Dispensatory, page 986.) The mass may be kept soft by wrapping it in bladders, putting it in covered pots, and occasionally moistening it, as it becomes dry.

TROCHES.—TROCHISCI.

What are troches or lozenges ?

They are small solid masses, composed of powders, sugar and mucilage, intimately incorporated and usually made into flat cakes and dried.

How are they used ?

They are held in the mouth and allowed to dissolve slowly, in the saliva ; employed chiefly in affections of the throat.

CONFECTIONS.—CONFECTIONES.

What are these, and how divided ?

They are soft solids, made by incorporating medical substances with saccharine matter. They are divided into *conserves* and *electuaries*.

How are these prepared, and what are their uses?

Conserves are made of recent vegetable substances and refined sugar, beat into a uniform mass. Intended, sometimes, to preserve, by means of the sugar, the properties of recent vegetable plants, but more frequently used as vehicles of other substances.

Electuaries are usually extemporaneous preparations, made by mixing dry powders, for the most part, with syrup, honey or molasses, to cover their taste and facilitate their exhibition.

2.—*Liquid Forms.*

MIXTURES.—MIXTURÆ.

What are these and how prepared?

They are generally extemporaneous prescriptions, consisting of one or more insoluble substances, either liquid or solid, suspended in water by the intervention of some viscid substance, as gum arabic, sugar or yolk of eggs. When an oil is suspended in this way, the mixture is called an *emulsion*. As a general rule, the substance to be suspended, should be first thoroughly mixed with the intermedium and then with the water.

What are the objects of this form of preparation?

It is intended to facilitate the administration, and conceal the taste of unpleasant medicines.

INFUSIONS.—INFUSA.

What are these and how prepared?

They are aqueous solutions of vegetable principles, obtained by maceration either with or without heat. Hot water is more frequently employed, its solvent powers being generally greater. Cold water is to be preferred when the active principle of the vegetable is very volatile or easily injured by heat, and when we wish to avoid the solution of some principle which is insoluble at a low temperature. The substance sliced or

bruised, is usually acted upon in a porcelain, or glazed earthenware vessel, fitted with a cover, and when hot water is employed, it is allowed to stand till it cools, or if a longer continuation of the heat be required, the vessel is set near the fire; when cold water is used, the maceration should be continued longer. A very strong infusion may be obtained by the process of *displacement*. (See U. S. Dispensatory, page 731.) The undissolved portions may be separated by filtration through fine linen.

DECOCTIONS.—DECOCTA.

What are these, and how prepared?

They are aqueous solutions of vegetable principles, obtained by ebullition. The substance to be acted on is powdered or well bruised, when dry, and sliced when fresh, and boiled for a short time in water, in a covered vessel. In compound decoctions, the several ingredients may be added at different times, according to their relative solubility; and any substance, the active principle of which is volatile, may be added after the vessel is removed from the fire, and the decoction allowed to cool with the vessel covered.

What are the advantages and disadvantages of this mode of preparation?

The soluble principles of vegetables are more readily and rapidly extracted, as a general rule, by boiling than by maceration; consequently, it may be preferred to infusion, when it is desired to obtain a strong solution in a short time. The objections to it, in certain cases, are the same, though stronger, as those assigned to the use of hot water, under the head of infusions.

What is their liability to spoil, and the best mode of preserving them?

Most decoctions are soon rendered unfit for use by the action of the air and the re-action of their constituents; consequently, they should be made only when wanted for use, and not kept, in warm weather, longer

than 48 hours. Decoctions and infusions may be preserved, it is said, for several months, in bottles with accurately ground stoppers. They should be strained and poured into the bottles, while *hot*, until these are entirely filled, to the exclusion of the air, and the stopper then made to displace its own bulk of the liquid.

MEDICATED WINES.—VINA MEDICATA.

What are the advantages and disadvantages of wine, as a solvent?

The alcohol which it contains, enables it to dissolve substances insoluble in water, and exerts, also, a preservative influence, rendering its preparations more permanent than infusions or decoctions. They are less stimulating than tinctures, owing to the smaller proportion of alcohol they contain, and the modified state in which it exists in composition; but, for the same reasons, they are more apt to undergo decomposition. A considerable inconvenience attending wine as a menstruum, is the variable proportion of alcohol which it contains, and the consequent inequality of strength of its preparations.

How are they prepared and kept?

Prepared by maceration, without heat, for about 14 days. Teneriffe wine is directed to be used, by the U. S. Phar., though good Sherry or Madeira will answer equally well. They are kept in well stopped bottles, in cool places.

TINCTURES.—TINCTURA.

What are these, and how prepared?

They are solutions of medicinal substances, in *alcohol*, or *diluted alcohol*, obtained, usually, by maceration, at ordinary temperatures, for two weeks, in well stopped glass bottles, frequently agitating.

Of what strength is the alcohol employed?

Officinal alcohol or rectified spirit, (sp. gr. 0.835,) is used when the substance to be dissolved is insoluble in water, as resins, essential oils, &c. ; but *diluted alcohol* or *proof spirit*, (sp. gr. 0.935,) is employed when the substance is soluble both in alcohol and water, or when several principles are to be extracted, some of which are soluble in the one, and some in the other.

What are the advantages of diluted alcohol, as a menstruum?

It generally extracts more of the active principles of plants, and affords a cheaper and less stimulating tincture than rectified spirit, and yet contains sufficient alcohol to prevent spontaneous decomposition.

What are the conveniences of this form in prescription?

It affords a convenient method of administering active medicines, which require to be given in small doses, but the stimulating properties of the alcohol, and its liability to beget habits of intemperance, when long continued, should always be kept in view.

VINEGARS.—ACETA.

To what is this title applied?

To *distilled vinegar* and *medicated vinegars*.

What are the advantages and disadvantages of vinegar, as a solvent?

The acetic acid which it contains, gives it the power to dissolve some substances which are not entirely soluble in water alone, and renders it an excellent solvent of the vegetable alkalies, which it converts into acetates without injuring their medicinal virtues. Its infusions, however, are apt to spoil when long kept, to prevent which, a small portion of alcohol is usually added.

SYRUPS.—SYRUP.

What are syrups, and how divided?

They are concentrated aqueous solutions of sugar,

with which medicinal substances are sometimes incorporated; hence they are divided into *simple syrup* and *medicated syrup*.

How are they prepared, and best preserved?

Medicated syrups are prepared by dissolving refined sugar in vegetable infusions, decoctions, expressed juices, fermented liquors, or simple aqueous solutions, and are often concentrated by evaporating the watery fluid, with a moderate heat, where the active ingredients are not liable to be injured by it. Principles which are not readily imparted to water, or are volatilized or decomposed by a heat of 212° , are sometimes extracted by alcohol, which can be driven off with less heat than water. Medicated syrups are apt to undergo fermentation and other changes, to prevent which, several preservatives have been recommended; as sugar of milk, sulphate and chlorate of potassa, but it is best to prepare them in small quantities at a time, and keep them in well stopped bottles, entirely filled, in a cellar or some other cool place.

HONEYS.—MELLITA.

For what is honey used in pharmacy?

Only as a vehicle for active medicines.

What are the advantages and disadvantages attending it, as a vehicle?

Its preparations are said to be less apt to become candied than those of syrup, but it is more apt to disagree with the stomach, and its variable consistence renders it difficult to apportion accurately the dose.

What are those preparations called, in which honey and vinegar are combined?

Oxymels.

LINIMENTS, OINTMENTS AND CERATES.

What are these?

Liniments are preparations intermediate in consist-

ence, between that of water and ointments, intended to be applied to the skin by gentle friction with the hand.

Ointments are fatty substances, about the consistence of butter, intended to be applied to the skin by inunction.

Cerates are unctuous compounds, consisting of oil or lard incorporated with wax, spermaceti or resin, and frequently with various medicinal agents. They are intermediate in consistence, between ointments and plasters; can be spread on linen or leather with a spatula, at ordinary temperatures, but do not melt or run when applied to the skin.

CATAPLASMS AND PLASTERS.

What are these?

Cataplasms or poultices are soft, moist preparations, intended for external application. They are generally prepared extemporaneously, and of different materials, according to the indications to be fulfilled.

Plasters are solid substances at ordinary temperatures, but become soft and adhesive with a moderate heat, which qualities they retain at the temperature of the human body. As met with in the shops, they are usually in cylindrical rolls, enveloped in paper.

What is the basis of most plasters?

The *Emplastrum Plumbi*, or *lead plaster*; a few owe their consistence to resin or wax.

How are they prepared for use?

By spreading them on a piece of soft and pliable leather, as sheep skin, when they are to be applied to the sound skin, or upon linen or muslin, when intended as dressings to abraded surfaces. A border of about half an inch in breadth, is usually left uncovered with the plaster, to prevent its soiling the clothes, and to facilitate its removal. This may be accurately done by means of two rulers made of sheet tin, (see a representation on page 765, U. S. Dispensatory, edit.

1845,) or by pasting a piece of paper upon the leather or cloth, with a portion cut out of the centre, of the shape and dimensions of the intended plaster. The plaster may be melted with a heated spatula, and allowed to fall on a piece of coarse paper, and when nearly cool, uniformly spread on the leather.

PARTS TO WHICH MEDICINES ARE APPLIED.

What are they?

Medicines are applied to the stomach, the rectum, the skin, the tracheo-bronchial mucous membrane, the nasal or pituitary membrane, and are sometimes injected into the veins. They are also applied chiefly for their local effects, to the mucous membranes of the mouth, urethra, bladder, vagina, &c.

The *stomach*. What is the mode of using medicines by the stomach called, and what are its advantages?

It is called the *method by ingestion*, and is the one most commonly and advantageously resorted to, on account of the great susceptibility of the stomach, its active absorbing power, and its strong and extensive relations in the system.

The *rectum*. In what forms, and for what purposes are medicines applied to this part?

They are introduced in the solid and liquid state, and for one of two objects,—to evacuate the bowels, or to obtain the peculiar effects of the medicine.

What are solid substances called, when used in this way, and how are they prepared for the purpose?

They are called *suppositories*, made usually like pills, of a globular shape, and of a convenient size.

What are liquids called?

Clysters, injections or enemata.

What are the general rules in relation to the dose of a medicine, and the quantity of liquid vehicle to be given by the rectum?

The quantity of a medicine, as a general rule, is

about *three* times the ordinary dose, but in cases of very active medicines, it is safer to begin with less. The proper quantity of liquid varies according to the object in view, and the age of the patient. If the medicine is to be retained, the bulk of the vehicle should be small,—from $f\text{ } \frac{3}{4}$ j. to $f\text{ } \frac{3}{4}$ ij., for an adult,—if to operate on the bowels, larger,—Oj. And the first impulse to evacuate the bowels, even in this case, should be resisted, or prevented, if necessary, by pressing a folded towel against the part.

The *skin*. How are medicines applied to this part?

They are applied either *epidermically* or *endermically*, with the cuticle remaining or removed, and in the various forms of vapor, bath, lotion, fomentation, embrocation, ointment, cerate, &c. The endermic method is preferred, when the medicine acts by being absorbed. The cuticle may be removed by a blister, and the epigastrium or inner parts of the extremities are the places generally selected.

What circumstances render a resort to this method advisable?

Inability or indisposition of the patient to swallow, or of the stomach to retain medicines; inflammation of the gastric mucous membrane, or a want of susceptibility of this part to the action of the medicine, from frequent repetition; the necessity, in some urgent cases, of introducing medicine by every possible avenue; the indication to invite irritation from internal parts, by revulsion, or to apply the medicine to or as near the diseased part as possible.

What is the relative dose by this method?

Two or three times the dose by the mouth.

Tracheo-bronchial mucous membrane. How are medicines applied to this part?

Chiefly in the form of vapor, by an inhaler, or when this cannot be had, a tea-pot or basin, with an inverted funnel.

Nasal or pituitary membrane. For what purposes are medicines applied to this part.

Mostly for their excitant or derivative effects on neighboring parts. When they produce a discharge, they are called *errhines*, when sneezing, *sternutatories*.

Into the *veins*. What are the advantages and disadvantages of this method?

The effects of medicines may be obtained very speedily in this way, and it is preferred by some, to the method of ingestion, as they suppose the virtues of medicines are injured or altered by the digestive process, in the latter case; but the danger from introducing too much liquid or air into the veins, is imminent, so much so, that it is seldom expedient to resort to it.

WEIGHTS AND MEASURES USED.

What weights and measures are recognized by the U. S. Pharm., and used by the apothecary in compounding and dispensing his medicines?

The *apothecaries' weight*, and *apothecaries' or wine measure*, the divisions and equivalents of which, are as follows:

APOTHECARIES' WEIGHT.

Pound.	Ounces.	Drachms.	Scruples.	Grains.
℔ 1	= 12	= 96	= 288	= 5760
	℥ 1	= 8	= 24	= 480
		ʒ 1	= 3	= 60
			ʒ 1	= gr. 20

APOTHECARIES' OR WINE MEASURE.

Gallon.	Pints.	Fluidounces.	Fluidrachms.	Minims.
Cong. 1	= 8	= 128	= 1024	= 61440
	0 1	= 16	= 128	= 7680
		f ʒ 1	= 8	= 480
			f ʒ 1	= m 60

What approximate measures are sometimes substituted for the above?

A *tea-cup*, estimated to hold about f ʒ iv. or a gill.

A *wine-glass*, f ʒ ij.

A *table-spoon*, f ʒ ss.

A *tea-spoon*, f ʒ j.

A drop is generally considered equivalent to a minim, but varies in size according to the nature of the fluid, and the size and shape of the vessel from which it is dropped.

CLASSIFICATION OF MEDICINES.

What is Dr. Wood's classification of medicines, and the basis upon which it is founded ?

His classification, which is founded on the relations that medicines bear to the human system, in a state of health, is as follows :

Substances which act on the living body.

General remedies.

Stimulants.

Permanent stimulants.

Astringents.

Tonics.

Diffusable stimulants.

Arterial stimulants.

Cerebro-nervous stimulants.

Cerebral stimulants.

Nervous stimulants.

Sedatives.

Arterial sedatives, or refrigerants.

Nervous sedatives, or sedative narcotics.

Local remedies.

Affecting the functions.

Emetics.

Cathartics.

Diuretics.

Diaphoretics.

Expectorants.

Emmenagogues.

Sialagogues.

Errhines.

Affecting the organization.

Rubefacients.

Epispastics.

Escharotics

Operating mechanically.

Demulcents.

Emollients.

Diluents.

Medicines insusceptible of accurate classification.

Ergot.

Nux vomica.

Arsenic.

Mercury.

Iodine.

Substances which act on foreign matters contained within the body.

Antacids.

Anthelmintics.

I. ASTRINGENTS.

What are astringents ?

They are substances which produce contraction and condensation of the living tissues.

What is their *modus operandi* ?

Their general action is thought to be entirely vital, and is extended chiefly by nervous sympathy.

What are their general effects upon the system ?

They produce a gentle, but permanent excitement of the system, a harder and more contracted pulse, and a diminution of all the secretions.

What circumstances indicate and contra-indicate their use ?

They are indicated by all morbid discharges which depend upon relaxation of the tissues; contra-indicated by much general or local excitement, and by any discharge which is a mere effect of some disease, and which it is calculated to relieve.

Mention some particular diseases in which astringents are frequently employed.

Hemorrhages, particularly of a passive character, diarrhœa, chronic dysentery, diabetes, catarrh of the bladder, ephidrosis, or profuse sweating, &c. Locally, they are employed in external hemorrhages; in inflammatory affections of the throat, nostrils, rectum, vagina, urethra, &c., after the active stage of the inflammation has subsided; and in relaxations of the vagina, uvula, anus, and other parts.

How are astringents divided ?

Into *vegetable* and *mineral*.

To what proximate principle do the former owe their astringency ?

To *tannin*, or *tannic acid*.

What are the physical and chemical properties of this principle ?

When pure, it is a yellowish-white, uncrystaliza-

ble solid, of a strong astringent taste, and void of bitterness. It is very soluble in water, moderately so in alcohol, but sparingly soluble in ether. Exposed to the air, it absorbs oxygen, and is partly converted into *gallic acid*. Its solution reddens litmus paper. Its ultimate constituents are carbon, hydrogen and oxygen.

What are its relations to acids, alkalies, metallic oxides and salts, starch, albumen, gluten and gelatin?

In solution it forms precipitates with several of the acids, as the sulphuric, nitric, muriatic, and arsenic; it unites with most of the salifiable basis, forming salts which are of difficult solubility. It affords precipitates with most of the metallic oxides, and with many of the metallic salts; with the sesquisalts of iron it forms a black precipitate, which is the basis of ink. It precipitates solutions of albumen, starch and gluten, and forms an insoluble compound with gelatin, which is the basis of leather.

What are its therapeutical applications?

It has been successfully used in hemorrhages; in colliquative sweats, diarrhœa, &c.

What is the dose and mode of administration?

Dose, from gr. ss. to gr. ij.; given in pill or solution.

1. *Vegetable Astringents.*

What are some of the principal vegetable astringents?

Oak bark,—white and black,—galls, kino, catechu, rhatany, logwood, cranesbill, blackberry root, dewberry root, uva ursi, and pipsissewa.

WHITE-OAK BARK.—QUERCUS ALBA..

BLACK-OAK BARK.—QUERCUS TINCTORIA.

What are the physical properties of these barks?

White-oak bark is of a light brown color, of a

coarse texture, and of difficult pulverization. It has a feeble odor and an astringent, bitterish taste. Black-oak bark differs from the above by its greater bitterness, and by staining the saliva yellow, when chewed.

What are their chemical properties?

The chief ingredients of white-oak bark, are *tannic* and *gallic acids*; of black-oak bark, *tannin* and a coloring principle called *quercitrin*—these are imparted to water and alcohol.

For what purposes are these varieties of oak-bark employed in the arts?

They are sometimes used for tanning leather; and the black-oak bark, in the form of a coarse powder, and under the name of *quercitrin*, is much employed in Europe for dyeing wool and silk of a yellow color.

What are the medical properties and remedial applications of oak-bark, both internally and externally?

It is astringent and slightly tonic; occasionally used internally, in chronic diarrhœa and dysentery; in hemorrhages and intermittent fever, more frequently employed externally. In the form of decoction, it has been used as a bath in some diseases of children, as marasmus, scrofula, cholera infantum, intermittent fever, &c. It is also used as a gargle in slight inflammation or relaxation of the uvula and tonsils; as an injection in fluor albus, prolapsus of the uterus and rectum, and as a wash to flabby, ill-conditioned ulcers.

Which, of the two officinal species, is to be preferred for internal use, and why?

The white-oak bark, as it is less apt to irritate the bowels?

What are the forms of administration, and dose of each?

Given in powder, decoction and extract. Dose of the powder, from ʒ ss. to ʒ j.; of the decoction, prepared by boiling ʒ j. in Oij. of water down to Oj., f ʒ ij.; of the extract, 20 grains.

GALLS.—GALLA.

What are these, and from what derived?

They are morbid excrescences, derived chiefly from the *Quercus infectoria*—a small tree or shrub growing in Asia Minor and Armenia.

How are they produced?

They are formed in consequence of the irritation occasioned by the puncture of a hymenopterous insect, the *Cynips quercusfolii* of Linnæus, which pierces the young branches and deposits its egg.

From whence are they imported?

From the Levant and the East Indies.

What are their physical properties?

They are of a roundish shape, and of a size varying from that of a pea, to that of a large cherry. They are tuberculated externally, hollow and of a whitish color within. They have no odor, but a bitter and very astringent taste.

What are the commercial varieties of galls, and what is the difference between them?

There are two varieties—*blue galls* and *white galls*. The former are collected before the escape of the insect, and are the best; the latter after it has escaped and are perforated with a round hole. These are also larger, of a lighter color and much inferior in astringency.

What are the chemical properties of galls?

The most important ingredients are *tannin* and *gallic acid*, which are extracted by water and alcohol.

With what substances are they incompatible in prescription?

With the mineral acids, the salts of lead and iron, the sulphate of copper, the nitrates of silver and mercury, the carbonates of ammonia and potassa, with tartar emetic and lime water, and with the infusions of cinchona, columbo, opium, ipecacuanha, &c.

What are their remedial uses?

Though powerfully astringent, they are seldom employed internally; occasionally given in chronic diarrhœa. In the form of infusion or decoction they are sometimes used as an astringent wash, injection or gargle, and an ointment made with one part of powdered galls to 8 parts of lard, to which opium is sometimes added, is much used in hemorrhoidal affections.

How are they given, and what is the dose?

Given in powder, infusions and tincture. Dose of the powder, 10 to 20 grains; of the infusion, made in the proportion of ʒj. to Oj. , $f\text{ʒj.}$ to $f\text{ʒij.}$ The tincture is seldom given internally, chiefly used as a chemical re-agent. Dose $f\text{ʒij.}$ to $f\text{ʒiij.}$

KINO.

What is kino and its supposed origin?

It is thought to be an extract, derived from a plant not certainly known, probably from the *Nauclea Gambir*, a twining East India shrub.

What are the different varieties of kino?

There are several varieties, viz: *African kino*, *Jamaica kino*, *Botany Bay kino*, and *East India*, or *Amboyne kino*.

Which of these is mostly used in this country?

The East India variety.

What are its physical and chemical properties?

As found in our shops, it is usually in small angular, shining, brittle fragments, of a deep brown color, and affords a powder of a lighter hue. It is without odor, but has a very astringent, bitterish taste. Its most important constituents are *tannin* and *extractive*, to the former of which it owes its astringency. Water dissolves it partially, alcohol, the larger portion.

With what substances is it incompatible?

With all those enumerated under the head of galls.

What are its medical properties and uses?

It is a very efficient astringent, well suited for internal

uses. It may be resorted to in all those conditions of the system which call for the use of astringents.

What are the forms of administration, and the dose of each?

It is given in powder, infusion and tincture. Dose of the powder, 10 to 30 grains; of the infusion, $f\text{ } \mathfrak{z}\text{ ss.}$ to $f\text{ } \mathfrak{z}\text{ jss.}$; of the tincture, $f\text{ } \mathfrak{z}\text{ j.}$ to $f\text{ } \mathfrak{z}\text{ ij.}$

What is the objection to the tincture?

It is apt to become gelatinous when kept.

CATECHU.

What is catechu?

It is an extract, obtained from the wood of the *Acacia Catechu*, a small tree growing in Hindostan.

What are its physical properties?

It occurs in irregular masses, weighing from a few ounces to a pound each; of a chocolate brown color externally, and varying from a yellowish-brown, to a dark liver color internally; it is brittle, and presents when broken, a smooth, shining, resinous fracture, in the best specimens.

What are its impurities?

It frequently contains sand, sticks, &c.

What are its chemical and medical properties?

They are nearly similar to those of kino, but it is more impure, and consequently less used internally.

What are the forms of administration, and the dose of each?

It is given in powder, infusion and tincture. Dose of the powder, 10 to 30 grains. The infusion, made in the proportion of $\mathfrak{z}\text{ ij.}$ to Ojss. of boiling water, to which cinnamon, or other aromatic, is sometimes added, may be given in the dose of $f\text{ } \mathfrak{z}\text{ j.}$ or $f\text{ } \mathfrak{z}\text{ ij.}$ Dose of the tincture, $f\text{ } \mathfrak{z}\text{ j.}$ to $\mathfrak{z}\text{ iij.}$

RHATANY.—KRAMERIA.

What is this officinally?

It is the root of the *Krameria triandra*, a small plant or shrub growing in Peru.

What are its physical properties?

The roots are long and branching, varying in thickness from that of a quill to that of the thumb, and often attached to the common root stock, which is still larger and an inch or more in length. They consist of a reddish-brown bark, and a ligneous central portion, which is of a reddish-yellow color. The root is inodorous, but the bark has a strong astringent, somewhat bitter taste.

What are the relative virtues of the cortical and ligneous portions?

The woody part is comparatively inert, and consequently the smaller pieces are preferred, as they contain less of this.

What is its active ingredient, and its relation to water and alcohol?

The active principle is tannin, which is extracted by water and alcohol, along with the coloring matter of the root.

What are its medical properties and uses?

They are the same with those of kino and catechu.

What are the forms of administration, and the dose of each?

It is given in powder, decoction, tincture, and extract. Dose of the powder, 20 to 30 grains; of the decoction, made by boiling one ounce in a pint of water, f ʒj. to f ʒij.; of the extract, prepared by evaporating the tincture or infusion, 10 to 15 grains.

LOGWOOD—HÆMATOXYLON.

From what tree is this derived?

From the *Hæmatoxylon Campechianum*, a tree of medium size, growing wild in Campeachy, and other parts of tropical America, and naturalized in Jamaica.

In what state does the wood exist in commerce, and in the shops?

It is imported in the form of billets, deprived of the sap-wood, and kept in the shops for medical use, in the state of chips or coarse powder.

What are its sensible properties, and its relations to water and alcohol?

It is of a deep red color, becoming dark by exposure, of a faint agreeable odor, and of a sweetish astringent taste. It yields its virtues to water and alcohol.

What is its characteristic ingredient?

A peculiar coloring principle, called *hematin*, which is also dissolved by water and alcohol, and imparts to the solutions, a fine purple color.

What are its medical properties and uses?

It is a mild astringent, given in chronic diarrhœa and dysentery, and in cholera infantum, after the active stage has subsided.

How is it given, and what is the dose?

Given in decoction and extract. Decoction prepared by boiling, \mathfrak{z} .j. of the rasped wood in Oij. of water, down to Oj. Dose, \mathfrak{f} \mathfrak{z} .j. to \mathfrak{f} \mathfrak{z} .ij. Dose of the extract, 10 to 30 grains.

CRANESBILL.—GERANIUM.

What is cranesbill, officinally?

It is the root of the *Geranium maculatum*, an herbaceous, perennial plant, growing in the woods, in every part of the United States.

What are the physical properties of the root?

In the dried state, it is in pieces from one to two inches in length, and from a quarter to half an inch in diameter; contorted, wrinkled, tuberculated and beset with slender fibres, of an umber-brown color, externally; reddish-gray internally. It is inodorous, but has an astringent taste, devoid of bitterness or other unpleasant flavor.

What are its relations to water and alcohol?

They extract its virtues, which depend upon *tannin*.

What is its character as an astringent ?

It is one of our best and most efficient indigenous astringents, and in consequence of no unpleasant taste, it is well adapted to cases of children, and persons with delicate stomachs.

What are some particular diseases in which it has been given with benefit ?

Diarrhœa, chronic dysentery, the latter stages of cholera infantum, and hemorrhages ; as an application to indolent ulcers ; as an injection in gleet and leucorrhœa, and as a gargle in relaxed uvula, and aphthous ulcerations of the throat.

What are the forms of administration, and the dose of each ?

Given in powder and decoction. Dose of the powder, 20 to 30 grains. Of the decoction, made by boiling \mathfrak{z} j. in Ojss. to Oj. f \mathfrak{z} j. to f \mathfrak{z} ij. It is sometimes boiled in milk, for children.

BLACKBERRY-ROOT.—*RUBUS VILLOSUS*.

DEWBERRY-ROOT.—*RUBUS TRIVIALIS*.

What is the character of these plants ?

The former is an erect prickly shrub ; the latter, a creeping briar ; both of which are very common in the United States, their berries being much used for food.

What is their active principle, and in what part of the root does it reside ?

The active ingredient is *tannin*, which resides chiefly in the cortical portion, consequently, the smallest roots are the best.

What are their medical properties and uses ?

They are slightly tonic and strongly astringent. Given in chronic diarrhœa, &c.

How are they given, and what is the dose ?

They are usually given in decoction, prepared by boiling \mathfrak{z} j. of the small roots, or the bark of the larger ones, in Ojss. of water, to Oj., and given in the dose of f \mathfrak{z} j. or \mathfrak{z} ij. Dose of the powder, 20 to 30 grains.

UVA URSI.

What is this officinally?

The leaves of the *Arbutus Uva Ursi*, or bearberry, a small trailing, evergreen shrub, growing in the northern latitudes of the old and new continents, and in the United States, as far south as New Jersey.

What are the physical properties of the dried leaves?

They are thick and coriaceous, with entire rounded margins, smooth, shining, and of a dark green color, on the upper surface; paler and reticulated beneath. Their taste is bitterish and astringent, followed by a sense of sweetness. They are inodorous when fresh, but emit a faint odor when dried and pulverized, somewhat similar to that of hay.

What are the peculiarities by which they may be distinguished from other leaves, with which they are sometimes adulterated?

Their entire edges and reticulated under surfaces, together with their taste, will enable us to distinguish them from those of the *Vaccinium Vitis Idæa*, or red whortleberry, and the common box leaf, which are the most common adulterations; the former of which are sometimes minutely toothed on their edges, and dotted on their under surface; while both are deficient in astringency.

What are its active ingredients, and its relations to water and alcohol?

They owe their virtues to *tannin* and *bitter extract*, which they impart to water and alcohol.

What are its medical properties and uses?

It is astringent and tonic, possessing, it is thought, a specific tendency to the urinary organs, for the diseases of which it is principally given, such as gravel, chronic nephritis, ulceration of the kidneys and bladder, diabetes, catarrh of the bladder, &c.

What are the forms of administration, and the dose of each?

It is given in powder and decoction. Dose of the

powder, from 20 to 60 grains ; of the decoction, made by boiling ℥j. in Ojss., down to Oj. f ℥j. to f ℥ij., repeated 3 or 4 times a day.

PIPSISSEWA.—CHIMAPHILA.

What is pipsissewa ?

'The leaves of the *Chimaphila umbellata*, or *winter green*.

What is the character of this plant, and where does it grow ?

It is a small, beautiful evergreen, growing in the northern parts of Europe and Asia, and in all parts of the United States.

How may the leaves be distinguished from the *uva ursi*, with which they are sometimes mixed ?

By their greater length, their cuneiform or wedge shape, and their serrated edges.

What are their sensible properties ?

The fresh leaves, when bruised, emit a peculiar odor ; their taste is bitter, astringent and somewhat sweetish.

What are their active principles, and their relations to water and alcohol ?

Their active ingredients are *tannin* and *bitter extractive*, both of which are dissolved by boiling water, and by alcohol.

What are the medical properties and therapeutical applications of pipsissewa ?

It is diuretic, tonic and astringent, and has been advantageously used in dropsies, especially when attended with debility and disordered digestion. It has also been used, it is said, with benefit in scrofula, and in all those nephritic affections, in which *uva ursi* is recommended.

How is it given, and what is the dose ?

It is usually given in decoction, made by boiling ℥ij. in Oij. to Oij., the half of which may be taken in the course of 24 hours. The watery extract may

be given in the dose of 20 or 30 grains, 3 or 4 times a day.

What other vegetable substances are occasionally used for their astringency?

The rind of the pomegranate, (*granatum*,) the petals of the red rose, (*rosa gallica*,) the bark and unripe fruit of the persimmon, (*Diospyros Virginiana*,) tormentil, or the root of the *Tormentilla erecta*, and bistort, or the root of the *Polygonum Bistorta*.

What are the officinal preparations of *red roses*—*Rosa Gallica*?

The two most important, are the *confection of roses*, (*confectio rosæ*,) and the *compound infusion of roses*, (*infusum rosæ compositum*.)

What are the uses of these?

The confection is chiefly used in the formation of pills. The compound infusion, which is refrigerant and astringent, owing to the small proportion of sulphuric acid it contains, is sometimes used as a drink, in hemorrhages and colliquative sweats; but it is more frequently employed as a vehicle for sulphate of magnesia and other saline medicines, the taste of which it partly covers.

What are the uses of *rose water*, (*aqua rosæ*,) an officinal preparation of the *Rosa centifolia*, or hundred leaved rose?

It is used in connection with other substances, as a lotion for the eyes and other parts, on account of its pleasant odor.

What are the remedial uses of the *unguentum aquæ rosæ*, prepared from it?

It is much employed under the name of *cold cream*, as a cooling application to irritated and excoriated surfaces, and to chapped lips and hands.

2.—*Mineral Astringents.*

What mineral substances are used chiefly for their astringency?

Alum, and some of the preparations of lead.

ALUM.—ALUMEN.

What is alum, chemically ?

It is a double salt, consisting of sulphate of alumina and potassa.

What are its sources ?

It sometimes occurs native, but is more frequently prepared from alum ores, which contain some or all of its constituents, or by the direct combination of its constituents.

What are its physical properties ?

It crystalizes in regular octohedrons, but as met with in the shops, it is usually in crystalline masses, which are transparent, colorless, inodorous, and of a sweetish astringent taste.

What are the effects of exposure to the air and to heat ?

It effloresces slightly, in the air, and when exposed to heat, it first melts in its water of crystalization, then parts with it, and is converted into a white porous mass, constituting the officinal *dried alum*. By a red heat, part of the sulphuric acid is driven off, and a mixture of sulphate of potassa and pure alumina remains.

What is its relation to water ?

It is dissolved by cold, but more readily by boiling water.

What are its chemical incompatibles ?

The alkalies and their carbonates ; lime and magnesia, and their carbonates ; tartrate of potassa, and acetate of lead.

What is its character as an astringent, and its therapeutical applications as such ?

It possesses the property of astringency, in a high degree, for which it is used, both internally and externally. Internally administered, it has been found useful in chronic diarrhœa and dysentery—in passive hæmorrhages—in atonic mucous discharges—in the colliquative sweatings of hectic, and in colica picto-

num, &c. As a topical application, it is used to arrest hemorrhages from minute vessels; as from leech bites—in epistaxis—in menorrhagia, &c. In inflammatory affections of the throat, it is much used as a gargle, prepared with water, vinegar and honey; and in the early stages of the inflammatory sore throat of scarlatina, measles and small pox, it has proved useful, applied in the form of powder, either by means of the finger, or by insufflation. As a collyrium, it is used in chronic ophthalmia, and as an injection, in gleet and fluor albus.

What are the modes of administration?

It is given in powder, pill or solution, and sometimes in the form of *alum whey*, prepared by boiling 3 ij. of powdered alum in Oj. of milk, and straining.

What is the dose?

Dose, in substance, from 5 to 20 grains; of the whey, a wine glass full. The gargle made in the proportion of 15 to 20 grains to the fluidounce of water.

What is *alum cataplasm*, and its remedial use?

It is a coagulum, formed by rubbing alum with the whites of eggs; used as an astringent application, in chronic and purulent ophthalmia, placed over the eye, between folds of linen.

What is *alum curd*, and its use?

It is a coagulum, formed with milk; used sometimes as a substitute for the cataplasm.

LEAD.—PLUMBUM.

What are the effects of lead, on the system?

In the metallic state, it is considered inert, but in its various preparations, it is astringent and sedative.

What are the poisonous effects of its preparations?

In small doses, long continued, they produce a peculiar spasmodic colic, called *lead colic*, and partial paralysis, which depend upon their absorption. In large doses, they act locally, as irritant poisons, and in

consequence of the irritation produced, absorption is retarded, and the peculiar poisonous impression of lead, less apt to result.

How are its poisonous effects best counteracted?

By the administration of opium and sulphate of magnesia, or sulphate of soda; the former allays the spasm and pain in the bowels, while the latter evacuates them, and, at the same time, acts as an antidote, by converting any portion of the preparation, remaining in the bowels, into a sulphate which is insoluble, and consequently inactive.

What are the preparations of lead mostly used?

Litharge, or the semivitrified oxide; the carbonate, the acetate and the subacetate.

LITHARGE.—PLUMBI OXIDUM SEMIVITREUM.

What is litharge, chemically, and how is it prepared?

It is the protoxide of lead, rendered crystalline by fusion. It is obtained in the process for extracting silver from argentiferous galenas. Argentiferous lead, or an alloy of silver and lead is first extracted from the ore, which is then calcined in a current of air, when the lead is converted into litharge, by oxidation and fusion.

What are its physical properties?

It is in small vitrified scales, of a red or yellow color, and without odor or taste.

What are its impurities?

It usually contains copper, iron, silica and silver.

What are its uses?

It is never given internally. Its chief use is in the preparation of the *lead plaster*, Emplastrum Plumbi.

How is this plaster prepared?

By boiling litharge with olive oil and water, over a slow fire, constantly stirring, until the oil and litharge unite in a plaster.

What is the object of the water, in this process, and what chemical changes are supposed to take place?

Water is necessary to effect a union of the other ingredients. According to Chevreul, it is an instance of saponification. A re-action of the constituents of the oil, and of a small portion of the water, takes place, by which a sweetish substance, called *glycerin* and *oleic*, and *margaric acids*, are formed: the acids combine with the oxide, and form a mixture of oleo-margarate of lead,—the plaster.

What are its medicinal and pharmaceutical uses?

Lead plaster, or *diachylon*, as it is frequently called, is used to retain the edges of fresh wounds in contact, and to protect them from the action of the air; but chiefly in the preparation of other plasters, in many of which it exists as the basis.

CARBONATE OF LEAD.—PLUMBI CARBONAS.

By what other name is this preparation called?

White lead, and sometimes *ceruse*.

How is it prepared.

It is prepared by two methods. One consists in passing carbonic acid through a solution of subacetate of lead, when the carbonic acid combines with the excess of protoxide to form the carbonate, which precipitates and leaves a neutral acetate in solution. The other method, which is practiced on a large scale in the United States, consists in exposing plates of lead to the fumes of vinegar or acetic acid.

What are its physical properties and its relation to water?

It is in the form of a heavy, white opaque powder or lumps, devoid of odor or taste, and is insoluble in water.

What are its medical properties and uses?

It is said to be astringent and sedative, but being the most poisonous preparation of lead, it is never given internally: externally it is sometimes used as a topical

application in neuralgia, and to ulcerated and excoriated parts; applied usually in the form of ointment or cerate; sometimes the powder is sprinkled on the part.

What are the uses of the officinal plaster—Emplastrum Plumbi Carbonatis?

It is used as an application to inflamed and excoriated surfaces, as those occurring on the back and hips from long confinement in one position.

ACETATE OF LEAD.—PLUMBI ACETAS.

What is the common name for this preparation, and how is it prepared?

Commonly called *sugar of lead*. Prepared by two methods—one consists in dissolving litharge in distilled vinegar, by the aid of heat, and crystalizing the solution; by the other, a solution of this salt is obtained by the combined action of the air and vinegar upon plates of lead—the plates being partly immersed in vinegar and occasionally turned, so as to expose them alternately to the action of the air and of the vinegar.

What are its physical properties?

It is a white salt, crystalized in prismatic needles, with dihedral summits. It has an acetous odor and a sweetish astringent taste.

What is its chemical composition?

It consists of 1 eq. of acetic acid, 1 of protoxide of lead, and 3 of water.

How is it affected by exposure to the air?

It effloresces slowly in the air.

What are its relations to water and alcohol?

It is dissolved by water and alcohol; forming with the first, a turbid solution, owing to the carbonic acid it contains. This may be prevented by the addition of a small quantity of vinegar.

What are its incompatibles?

It is incompatible with all acids and many salts;

with the alkalies, lime water, vegetable astringents, mucilage and many other substances.

What are its medical properties and therapeutical applications?

It is powerfully astringent and sedative, and may be given in medical doses, not too long continued, without risk of producing poisonous effects. It is much used, either alone or combined with opium, in hemorrhages, dysentery, diarrhœa, cholera infantum, &c. In solution, it is used as a topical application in superficial inflammation, as injection in gonorrhœa, gleet and leucorrhœa, and as a collyrium in ophthalmia when unaccompanied with ulceration of the cornea; otherwise, it is apt to be deposited in the ulcers and leave an indelible stain.

What is the dose and mode of administration?

Medium dose, 2 grains, repeated several times a day; usually given in pills, sometimes in water, acidulated with vinegar. Strength of the solution as a collyrium, 1 or 2 grains to f ʒj of water; of the injection, from 2 to 5 grains to the fluidounce, and as a lotion for the sound skin, ʒij to Oj.

SOLUTION OF SUBACETATE OF LEAD.—LIQUOR PLUMBI SUBACETATIS.

What is the common name of this solution, and what is the mode of preparation?

It is commonly called *Goulard's extract of lead*. Prepared by boiling a mixture in due proportions of acetate of lead, litharge and distilled water. The acetic acid combines with an additional portion of the oxide to form the subacetate.

What are its sensible properties?

It is a colorless liquid, of an acetous odor and a sweetish astringent taste.

What are the effects of exposure?

It attracts carbonic acid from the air, and deposits a white precipitate of carbonate of lead; hence it should be kept in well stopped bottles.

What are its remedial uses?

It is used only as an external application, in sprains, bruises, burns, blisters, &c., applied by means of linen cloths kept constantly wet.

What is the proper strength for use?

It is too strong and should always be diluted; f ʒ ij. or f ʒ iij., may be added to Oj. of distilled water.

What are the uses of the *cerate of subacetate of lead*—*Ceratum Plumbi Subacetatis*?

Goulard's cerate, as it is commonly called, is a useful application to blistered surfaces indisposed to heal; to burns, scalds, chilblains and some cutaneous eruptions.

What other mineral preparations are frequently employed for their astringency?

The sulphates of zinc, iron and copper, &c., but these possess also tonic properties and are treated of under that head.

II. TONICS.

What are tonics?

They are moderately excitant substances, the continued administration of which imparts strength and vigor to the debilitated system.

What is their *modus operandi*?

Operating upon the vital principle, they increase the energies of the digestive organs, and through the medium of the nerves or blood-vessels, impart vigor to the whole system.

In what conditions of the system are they likely to prove useful, and hurtful?

The moderate but permanent excitement which they produce, render them useful in relaxation and debility, and hurtful in diseases of excitement and in a state of health; as all excitement above the standard of health is followed by a corresponding depression.

How are tonics divided?

Into vegetable and mineral, according to the kingdoms from which they were originally derived.

To what principles do they owe their tonic powers?

The virtues of most vegetable tonics depend upon *bitter extractive*, or upon a principle possessing bitterness. Mineral tonics have no principle in common, to which their tonic property may be ascribed.

1. *Vegetable Tonics.*

What is Dr. Wood's division of these?

He divides them into 1., pure bitters; 2, bitters of peculiar or modified properties; and 3, aromatics.

1. PURE BITTERS.

What are the effects of these on the system?

In moderate doses, they increase the appetite and promote digestion, without exerting much influence over either the circulatory or nervous systems. In large doses, they sometimes purge and vomit.

What are the articles composing this division?

Quassia, simaruba bark, goldthread, gentian, American centaury and columbo.

QUASSIA.

What is quassia officinally?

The wood of the *Quassia excelsa* and *Quassia amara*—the former a tall tree, sometimes 100 feet high, growing in Jamaica and other West India islands; the latter a small tree or shrub inhabiting Surinam.

From which of these trees is quassia chiefly obtained?

From the *Quassia excelsa*.

What are its physical properties?

It is imported in cylindrical billets of various sizes, frequently covered with a smooth whitish brittle bark.

The wood is light, of a pale-yellow color, inodorous and of an intensely bitter taste. It is kept in the shops split into small pieces, or rasped.

What is its active ingredient, and its solubility in water and alcohol?

Active principle, bitter extractive, called *quassin*, which is extracted by water and alcohol.

What are its medical properties and therapeutical applications?

It is one of the most efficient of the pure bitters, and may be given in all cases requiring a simple tonic impression. Much used in dyspepsia, depending on atony of the digestive organs.

What are the forms of administration, and the dose of each?

Given in infusion, extract and tincture. Infusion, made in the proportions of ʒ ij. to Oj. of cold water; dose f ʒ ij. 3 or 4 times a day; dose of the extract, from 2 to 5 grains; of the tincture, f ʒ j. to f ʒ ij.

SIMARUBA.

What is this officinally?

The bark of the root of the *Quassia Simaruba*.

What are its medical properties and uses.

It is similar in properties to quassia, and may be given for the same purposes. It is seldom employed in this country; formerly much used in France in dysentery and diarrhœa.

How is it given, and in what dose?

Best given in infusion made in the proportion of ʒ ij. or ʒ iij. to Oj of boiling water, dose f ʒ ij. : dose of the powder, from a scruple to a drachm.

GOLDTHREAD.—COPTIS.

What is this officinally?

The root of the *Coptis trifolia*.

What is the character of this plant, and place of growth?

It is a small evergreen, with threadlike, orange-yellow roots, much resembling the strawberry in appearance. It inhabits the northern latitudes of Asia and America, and abounds in Canada and the New England States.

What are its medical properties and uses?

It is a simple bitter, closely resembling quassia in medical properties, and may be given in similar cases.

What are the forms of administration, and the dose of each?

It may be given in substance, infusion or tincture. Dose of the powder, from 10 to 30 grains; of the infusion, made in the proportion of ℥j. to Oj. of boiling water, f ℥j. to f ℥ij. ; of the tincture made in the same proportions, f ℥j. to f ℥ij.

GENTIAN.—GENTIANA.

What is gentian officinally?

It is the root of the *Gentiana lutea*.

What is the character of this plant, and place of growth?

It is a beautiful plant, from 3 to 4 feet high, bearing large yellow flowers, which appear in July. It is a native of the mountainous regions of Central Europe.

What are the physical properties of the root as found in the shops?

It is in pieces of various sizes; sometimes split longitudinally, with a wrinkled grayish-brown epidermis, yellowish within, and of a soft spongy texture. Its odor is faint but peculiar, and its taste at first sweetish, afterwards intensely bitter. It affords a yellowish powder.

What are its relations to water and alcohol?

These solvents extract its virtues, which according to Henry and Caventou, depend on a peculiar crystallizable principle, called by them *gentianin*; but this has been since found to be impure and not the active bitter principle which remains yet to be separated.

What are its medical properties and uses?

It is an excellent bitter tonic, more generally employed than any other of the same class. In very large doses it has been known to vomit and purge. The diseases in which it has proved useful, are atonic dyspepsia, gout, amenorrhœa, hysteria, scrofula, diarrhœa, worms, &c.

What are the forms of administration, and the dose of each?

It is seldom given in powder, usually in the form of infusion, tincture or extract. Dose of the powder, from 10 to 30 grains; of the infusion, made with ℥ ss. to Oj. of water, $f \text{ ℥ j.}$ to $f \text{ ℥ ij.}$; dose of the tincture, $f \text{ ℥ j.}$ to $f \text{ ℥ ij.}$; of the extract, 5 to 30 grains. There is an officinal compound infusion, which may be given in the dose of $f \text{ ℥ j.}$

AMERICAN CENTAURY.—SABBATIA.

What is the character of this plant, and place of growth?

The *Sabbatia angularis* or *American centaury*, is an annual herbaceous plant, with an erect stem from one to two feet high, and grows abundantly in the Middle and Southern States, in low grounds; flowering in July and August.

At what season should the herb be collected?

Whilst in flower.

What are its sensible properties, and its relations to water and alcohol?

Its taste is purely and strongly bitter; and its virtues are extracted, both by water and alcohol.

What are its medical properties and uses?

It is analogous, in its action, to the other simple bitters, and has been given in the apyrexia of intermittents, in slow convalescence from acute diseases, dyspepsia, &c.

How is it best given, and what is the dose?

Best given in infusion, made with ℥ j. to Oj. of boiling water. Dose, $f \text{ ℥ ij.}$

CUMBO.—COLOMBA.

What is cumbo, officinally ?

The root of the *Cocculus palmatus*, a climbing plant inhabiting the thick forests of Mozambique.

How is the root prepared for market, and from whence is it imported ?

The roots are dug up in March, and the offsets from the main root, the part used, are cut into transverse slices and dried in the shade. It is sent by the Portuguese, from the south-east of Africa, to India, and then distributed to various parts of the world.

What are its physical properties, as met with in our shops ?

It is in flat, circular pieces, from 3 to 10 lines thick, and from half an inch to three inches in diameter. The pieces consist of a brownish, wrinkled epidermis, a thick, yellowish inner bark, and a light, spongy, grayish-yellow central portion, which is depressed, from the shrinking during drying, and frequently marked with concentric circles and radiating lines. It has a feeble aromatic odor, and a strong, purely bitter taste, which is greater in the cortical than in the central portion. The pieces are brittle, easily pulverized, and affords a greenish-yellow powder.

What are its chemical properties ?

It contains a crystalline, very bitter principle, called *colombin*, on which its tonic properties depend: about one-third of its weight of starch, mucilage, a trace of volatile oil, &c. Boiling water and alcohol extract its virtues.

What are its medical properties and therapeutical application ?

It is one of the best bitter tonics, and may be given in all cases in which the simple bitters are indicated. It is frequently associated in prescription, with other tonics, with aromatics, mild purgatives and antacids; and an infusion made with cumbo, ginger and senna, is highly spoken of by Dr. Wood, as a remedy

for the permanent cure of a disposition to flatulent accumulations in the bowels.

What are the forms of administration, and the dose of each?

It is given in powder, infusion and tincture. Dose of the powder, 10 to 30 grains. The infusion is prepared by macerating half an ounce in a pint of boiling water, which dissolves also a portion of starch, and causes the infusion to spoil very soon; hence the Edinburgh College directs it to be made with cold water, by percolation. Dose of the infusion, from f ʒj. to f ʒij. ; of the tincture, f ʒj. to f ʒij.

2. BITTERS OF PECULIAR OR MODIFIED PROPERTIES.

How are these divided?

"Into 1. Those having a peculiar alkaline principle, as Peruvian bark. 2. Those in which the bitter principle is modified by combination with a sedative principle, as wild cherry bark. And 3. Those in which it is associated with a stimulant principle, usually a volatile oil, as serpentaria."

PERUVIAN BARK.—CINCHONA.

What are the sources of Peruvian bark?

It is derived from different species of *Cinchona*, tall shrubs or large forest trees, inhabiting the Andes, from 11° N. L., to 20° S. L.

What are the officinal varieties of bark, and the botanical origin of each?

There are three officinal varieties:—1, *pale bark*; 2, *yellow bark*; and 3, *red bark*. The exact species from which these varieties are respectively derived, is unknown; though the London College refers the pale bark to the *C. lancifolia*, the yellow to the *C. cordifolia*, and the red to the *C. oblongifolia*.

From whence are the officinal barks imported?

From the Pacific ports of South America.

What are *Carthagena barks*?

This name is applied to all those inferior varieties, which are brought from the northern Atlantic ports of South America.

1. *Pale bark*.—*Cinchona pallida*. What originated this name, and by what other title is this variety frequently called?

The epithet *pale* is derived from the color of the powder, and that of *gray*, by which the French distinguish this variety, from the color of the epidermis. The pale barks are also known, in commerce, by the name of *Loxa barks*; and those of superior quality are sometimes called *crown bark of Loxa*.

What are the physical properties of pale bark?

It is met with in the shops, in the form of quills, either single or double, from a few inches to a foot and a half in length, from two lines to an inch in diameter, and from a half to two or three lines in thickness. The epidermis, which is always present, is of a grayish color, owing to the lichens which cover it, and is usually marked with circular and longitudinal fissures. The interior surface of the quills is smooth, and of a cinnamon-brown color. The powder is of a pale-fawn color. Its odor is feeble, and its taste moderately bitter, and somewhat aromatic and astringent.

2. *Yellow bark*.—*Cinchona flava*. What is this variety commonly called, in commerce?

Calisaya bark; and by the French, *royal yellow bark*.

What are the varieties of yellow bark, and the physical properties of each?

The varieties are two:—the *quilled* and the *flat*; the former occurs in commerce, in pieces from half a foot to a foot and a half long, from half an inch to two or three inches in diameter, and from two to six lines in thickness. The epidermis, which is partially covered with grayish-white lichens, is rough, wrinkled longitudinally, furrowed transversely, easily separable

from the proper bark, and yields, when pulverized separately, a dark red powder, which is tasteless and inert. The *flat* pieces, like the quilled, are of various lengths, from 1 to 4 inches broad, and generally freed of their epidermis. Both sorts break with a fibrous, splintery fracture, are of a brownish-yellow color within and without, when deprived of the epidermis, and yield an orange-yellow powder. Its taste is less astringent than that of the pale variety, but more bitter and nauseous.

What is the relative strength of the quilled and flat varieties, and what the supposed cause of their physical differences?

The flat variety, though weaker than the bark proper of the quilled, yields a larger per cent. of the active principles, because free from epidermis. The cause of their most striking difference, is supposed to be owing to the quills being derived from the small branches, and the flat pieces from the large ones and from the trunks.

3. *Red bark*.—*Cinchona rubra*. What are the physical properties of this variety?

Like yellow bark, it is imported in quills and flat pieces; the quills being about the same size, while the flat pieces are sometimes very large and thick as if derived from the trunk of a tree. They are covered with a reddish-brown, sometimes grayish epidermis, which is rough, wrinkled, furrowed and often warty. The powder is of a pale reddish-brown color; the odor feebly aromatic, and the taste bitter and astringent.

What are the varieties of *Carthagena barks*, and the signs by which they may be distinguished from the officinal varieties?

There are several varieties, as the *yellow Carthagena bark*, the *brown Carthagena bark*, the *red Carthagena bark*, &c. The following marks, among others, will distinguish them: their whitish, smooth, micaceous epidermis; their less bitter and more disagree-

able taste, and the comparative small quantity of alkaline matter which they contain.

What are the chemical properties, and chemical differences of the several varieties of bark?

The most important ingredients of bark and those upon which its virtues chiefly depend, are two peculiar alkalies, *quinia* and *cinchonia*, which exist in combination with *kinic acid*: the other constituents are tannin, two peculiar coloring matters called *cinchonic red* and *cinchonic yellow*, fatty matter, kinate of lime, starch, lignin and gum, in the pale barks. The three officinal varieties of bark differ much in the proportion of the alkaloids they contain: thus *quinia* predominates in yellow bark, *cinchonia* in pale bark, while they are contained in nearly equal proportions in red bark.

Quinia and Cinchonia. What are the physical properties of these alkalies, and their chemical relations?

Quinia, when pure, is a white amorphous powder, inodorous and of a very bitter taste; is almost insoluble in water, very soluble in alcohol, soluble in ether and the fixed and volatile oils. Cinchonia is a white crystalline substance, nearly insoluble in cold, but slightly soluble in boiling water; less soluble in alcohol, ether and the oils, than quinia, and has a taste less bitter. They both form salts with acids, the tartrates, gallates and oxalates; being insoluble in cold water, unless the acid be in excess.

With what substances is bark incompatible?

With the alkalies and alkaline earths, and with all vegetable tinctures, infusions and decoctions, containing tannic acid; the former, precipitating the alkaline principles in a separate state; the latter, forming with them insoluble tannates. Other substances may form precipitates with its inert ingredients, and not incompatible in prescription.

What are its effects on the system?

It is eminently tonic, and by its peculiar excitant

action on the nervous system, is antiperiodic. In large doses it sometimes produces nausea and vomiting, and not unfrequently purges. Given so as to bring the system under its full influence, it produces a feeling of tension or fullness in the head, with ringing in the ears and partial deafness.

What are its therapeutical applications, both as a tonic, and as an antiperiodic?

As a tonic, bark and its various preparations are more highly esteemed and generally employed, than any other article of the *Materia Medica*. It may be given in all conditions of the system requiring the use of tonics, provided the stomach and digestive organs be not in an irritable condition: as in the latter stages of typhus gravior, and malignant scarlatina, in the suppurative stage of small pox and carbuncle, and in all other cases in which the system is exhausted from large purulent discharges, in gangrenous erysipelas, in convalescence from acute diseases, in scrofula, dropsy, passive hemorrhages, dyspepsia, hysteria, amenorrhœa, &c. As an antiperiodic, it is the most efficacious; given in intermittent fevers, in remittent fevers, with decided remissions, and in neuralgic affections, rheumatism, headache, amaurosis, stricture, epilepsy, &c., recurring at regular intervals.

What are the modes of administration, the advantages and disadvantages of each, and their doses?

It is given in powder, in infusion, simple and compound, in decoction, tincture, simple and compound, and in the form of extract. The form of powder to be preferred, when a very powerful impression is desired; objectionable on account of its disagreeable taste and its tendency to oppress and irritate the stomach and bowels. But given diffused in water or some aromatic infusion; often combined with opium, which corrects its tendency to purge, and increases its antiperiodic powers. Dose from 10 to 30 grains; as a tonic, pale bark preferred; red or yellow bark, most efficient as an antiperiodic; dose $\mathfrak{z}\text{j}$, repeated so that

℥j. or more may be taken during the intermission.

Infusion, (*Infusum Cinchonæ*, made by macerating ℥j. in Oj. of boiling water; may be given as a tonic, in the dose of f ℥ij. Not sufficiently potent as an antiperiodic.

Compound infusion, (*Infusum Cinchonæ Compositum*,) prepared with ℥j. to Oj. of cold water, acidulated with f ℥j. of aromatic sulphuric acid, is a much better and more efficient preparation than the last; the sulphuric acid combining with the alkalies and facilitating their solution. Dose f ℥ij.

Decoction, (*Decoctum Cinchonæ*,) prepared by boiling ℥j. in Oj. of water for 10 minutes in a covered vessel, may be given in the dose of f ℥j. or f ℥ij. This form is objectionable, as the virtues of bark are injured by long boiling, and even prepared as above, insoluble compounds are formed, which precipitate a portion of the alkalies on cooling, and render the decoction turbid; to obviate this the addition of aromatic sulphuric acid is recommended.

Tincture, (*Tinctura Cinchonæ*,)—a very strong preparation, but seldom given alone, on account of the large proportion of alcohol contained in an ordinary dose; usually given as an adjuvant to the infusion or decoction, in the proportion of f ℥j. or f ℥ij., to f ℥ij. of either of these preparations.

Compound tincture, (*Tinctura Cinchonæ Composita*,) which contains orange peel, Virginia snake-root, saffron and red saunders, and commonly known by the name of *Huxham's tincture of bark*, is a more agreeable, but less powerful tonic than the simple tincture, and like it is frequently associated with the infusion and decoction. Dose, from f ℥j. to f ℥ss.

Extract, (*Extractum Cinchonæ*)—prepared by means of water and alcohol; contains most of the principles of cinchona, but is seldom used since the introduction of sulphate of quinia into medicine. Dose, 10 to 30 grains.

Sulphate of Quinia. How is this salt prepared,

and what are its physical and chemical properties?

Yellow bark is boiled in water and muriatic acid, by which a muriate of quinia is formed; lime is added to the decoction, which displaces the quinia and allows it to precipitate, by combining with the muriatic acid to form a muriate of lime, which remains in solution. The precipitate is washed in distilled water, dried, and digested in alcohol. The alcohol is then distilled off, and upon the brown viscid mass remaining, sufficient sulphuric acid, largely diluted with water, is added to saturate the quinia. To this solution, animal charcoal is added, to remove the coloring matter, and after the liquor is sufficiently evaporated, it is filtered while hot, and set aside to crystalize. Sulphate of quinia is in fine, flexible, needle-like crystals, perfectly white, inodorous, and has a very bitter taste. Exposed to the air, it effloresces slightly; is fused by a moderate heat, and decomposed by red heat. It is very slightly soluble in cold water, more soluble in boiling water, and very soluble in alcohol, and in dilute acids. It consists of 1 eq. of sulphuric acid, 2 of quinia, and 8 of water, consequently it is a *disulphate*.

With what substances is it incompatible?

With the alkalies, and their carbonates; lime-water, tannin, the soluble salts of lead, &c.

What are the most common adulterations, and how may they be detected?

Sulphate of lime, starch, sugar and mannite, which may be detected by digesting in alcohol, when the sulphate of quinia is dissolved and the impurities left.

What are the advantages of this preparation?

While it contains all, or nearly all, of the medicinal virtues of cinchona, it possesses the several advantages over it, of being less apt to nauseate and oppress the stomach; and when the condition of that organ forbids its use by the mouth, it may be more effectually employed endermically, and by the rectum, it being

more speedily absorbed in the former case, and more easily retained in the latter.

How is it administered, and what is the dose?

It is given in solution and pill; the former, though more disagreeable, is yet to be preferred when a speedy or energetic impression is desired. Best given, dissolved in water, acidulated with aromatic sulphuric acid, and the bitter taste left, annihilated by chewing a piece of bread or apple. The pill is prepared with powdered gum arabic and syrup. Dose, as a tonic, 1 grain, 3 or 4 times a day; as an antiperiodic, from 10 to 20 grains or more, may be taken in divided doses, during the intermission. More effectual when given in large doses, say from 5 to 10 grains, or more immediately after the paroxysm has passed off. Three times the ordinary dose may be administered, *per anum*, in a few ounces of some bland liquid, or when this mode is impracticable, from 5 to 10 grains mixed with an equal quantity of some mild powder, as arrow root, may be sprinkled on the surface, denuded by a blister. 12 grains are equivalent to $\frac{3}{4}$ j. of good bark.

Impure Sulphate of Quinia. How is this obtained, and what is its chemical nature?

Obtained by evaporating the mother waters, poured off from crystals of sulphate of quinia. It is a mixture of the sulphates of quinia and cinchonia, with a peculiar yellowish matter.

What is its medical character and dose?

It produces the same effects on the system as the sulphate of quinia, but is much weaker, and requires to be given in double the dose.

Sulphate of Cinchonia. How is this salt obtained, and what are its relative virtues, as a medicine?

It may be obtained from pale bark, in the same way that sulphate of quinia is prepared from yellow bark. It possesses the same medical properties as the sulphate of quinia, and, it is thought, in nearly or quite an equal degree. Dose and modes of administration, the same.

DOGWOOD.—CORNUS FLORIDA.

What is the character of this tree, and the part used in medicine?

It is a small indigenous tree, very abundant in the Middle States, beautifying the forest, in the month of April, with its numerous, large, white blossoms. The bark, from every part of the tree, is used, but that from the root is best.

What are the physical properties of the bark, as met with in the shops, and its relations to water and alcohol?

It is in pieces of various sizes, more or less rolled, sometimes covered with a fawn-colored epidermis. It is very bitter, and affords a reddish-gray powder. Its odor is feeble, and its taste bitter and astringent. Water and alcohol extract its virtues.

What are its medical properties and uses?

It is tonic, astringent and feebly antiperiodic; and is sometimes given as a substitute for Peruvian bark.

How is it given, and in what dose?

Given in powder, infusion and decoction. Dose of the powder, ʒj., repeated, so that an ounce or two may be taken during the apyrexia. Dose of the decoction and infusion, prepared in the proportion of ʒj. to Oj. f ʒij.

WILLOW.—SALIX.

What is this officinally?

The bark of the *Salix alba* or *white willow*, a small tree introduced into this country from Europe.

What are the physical and chemical properties of the dried bark?

It is in pieces, usually quilled, and covered with a grayish epidermis. It has a bitter, astringent taste. Water and alcohol extract its virtues, which depend chiefly upon a peculiar crystalline principle, called *salicin*. This, when pure, is in white, slender crys-

tals, very bitter, soluble in water and alcohol, and is devoid of alkaline properties.

What are its medical properties and uses?

Willow bark is tonic and astringent, and has been successfully used as an antiperiodic. Salicin resembles the sulphate of quinia, in medical properties, for which it has been extensively substituted in intermittent fever.

What is the dose and mode of administration?

Dose of the bark, same as that of cinchona, given in powder or decoction. Dose of salicin, as a tonic, gr.ij. ; as an antiperiodic, $\mathfrak{D}j.$ or $\mathfrak{D}ij.$ may be taken in divided doses, during the intermission.

WILD-CHERRY BARK.—PRUNUS VIRGINIANA.

What is the character of the tree, and the part that yields the most active bark?

The *Prunus Virginiana* varies much in size, in different places, being very large in Ohio, and of small or medium size in the Eastern States. Its trunk is covered with a dark colored epidermis, which separates circularly. Its flowers are small and white, and its fruit globular, about the size of a pea, and, when ripe, of a shining blackish-purple color, much used to impart flavor to spiritous liquors. The inner bark, from all parts of the tree, is used, but that from the root is the strongest.

What are its physical and chemical properties, as kept in the shops?

It is in pieces of various sizes, of a bright cinnamon color, and yields a fawn-colored powder. Its taste is agreeably bitter and aromatic, with the flavor of bitter almonds. It imparts its sensible and medical properties to water, both cold and hot, forming an infusion of the color of Madeira wine. It is injured by boiling, in consequence of the volatilization of *hydrocyanic acid*, its active ingredient. This is generated by the re-action of water upon *amygdalin*, one of the

natural constituents of the bark. It also contains *tannin* and some other principle, probably *phloridzin*, which gives it tonic powers.

What are its medical properties, and therapeutical applications?

It is tonic, and also sedative, owing to the hydrocyanic acid. It is much used in cases of debility, associated with irritation, as in the hectic fever of consumption, and scrofula. It is also occasionally used as an antiperiodic, in intermittent fever, and as a tonic, in cases of dyspepsia, &c.

How is it best administered, and what is the dose?

Cold infusion the best form, made with ℥ ss. to Oj. Dose, f ℥ ij., 3 or 4 times a day. Dose of the powder, 3 ss. to 3 j.

CHAMOMILE.—ANTHEMIS.

What is this officinally?

The flowers of the *Anthemis nobilis*.

What is the character of this plant, and place of growth?

It is a small herbaceous plant, the flowers of which are single, with a yellow convex disk, and white rays. It is a native of Europe, and cultivated in this and other countries.

What are the physical and chemical properties of the flowers, as found in our shops, and from whence are they imported?

They are usually double from cultivation, of a yellowish-white color, of a fragrant odor, and of an aromatic bitter taste. Water and alcohol extract their sensible and medical properties, which depend on bitter extractive and volatile oil. Imported from Germany and England.

What is the difference between the *single* and *double* flowers?

The single ones are rather stronger, as the properties of the flowers exist in the greatest degree in the

disk, which is not fully developed in the double ones.

What are the medical properties and uses of chamomile?

In small doses, it is an aromatic, bitter tonic; in large doses, emetic. It is much used in the debility of convalescence, and in dyspepsia, depending on a want of tone in the digestive organs. Given, sometimes, as an emetic, but more frequently to assist the operation of other emetics. Sometimes applied to the abdomen as fomentations, in cases of inflammation of the abdominal viscera.

How is it best administered, and what is the dose?

Cold infusion best form, as a tonic; dose, $f\text{ } \frac{3}{4}$ ij. Hot infusion, as an adjuvant to emetics, may be given in large draughts. Dose of the powder, ss. to 3j. Decoction and extract, objectionable forms, as the volatile oil is partly driven off by the heat employed in their preparation.

THOROUGHWORT.—EUPATORIUM PERFOLIATUM.

What is the character of this plant, and the parts used in medicine?

Thoroughwort or *boneset*, is an indigenous, herbaceous, perennial plant, from three to five feet high, with long narrow leaves, perforated by the stems. The flowers are numerous, white, and appear in the middle and latter part of the summer. The tops and leaves are the parts used.

What are its sensible properties, and its relations to water and alcohol?

It has a faint odor, and a strong bitter taste. It yields its virtues to water and alcohol, which are thought to depend upon bitter extractive.

What are its medical properties and uses?

It is tonic, diaphoretic, and, in large doses, emetic and cathartic. Given in cases demanding the use of a tonic and diaphoretic. Intermittent, remittent and

typhoid fevers, rheumatism, catarrh and dyspepsia, are some of the diseases in which it is employed.

How is it administered, and in what dose?

As a tonic, best given in powder or cold infusion. Dose of the former, 20 to 30 grains; of the latter, made with ℥j. to Oj., f ℥ij., 3 or 4 times daily. As a diaphoretic, warm infusion, given in the same dose, every 2 or 3 hours, and the patient remain covered in bed. As an emetic and cathartic, a cupful or two.

VIRGINIA SNAKEROOT.—SERPENTARIA.

What is the name and character of the plant which yields this medicine?

It is derived from the *Aristolochia Serpentina*, a small herbaceous, perennial plant, growing in the woods, throughout the Middle, Southern and Western States.

Where is the root collected, and what are its physical and chemical properties, as brought into market?

Collected in western Pennsylvania and Virginia, in Ohio, Indiana and Kentucky, and brought into market in bales, mixed with the leaves and stems of the plant, and with dirt. The roots are in tufts of long slender fibres, attached to a short knotty head, of a yellowish color when fresh, becoming brown by age, and affording a grayish powder. It has an aromatic, agreeable odor, and a warm, very bitter taste. Water and alcohol extract its virtues, which depend on a bitter principle and volatile oil.

With what is it sometimes adulterated?

The *Spigelia Marilandica*.

What are its medical properties and uses?

It is an excitant tonic, producing also, diaphoresis or diuresis, according as it is used. Given in typhoid fevers, when tonics are indicated—in low grades of exanthematous diseases, to bring out the eruption—in intermittent fevers, associated with barks, &c.

How is it given, and what is the dose?

Given in powder, infusion and tincture. Dose of the powder, 10 to 30 grains; of the infusion, made with $\frac{3}{4}$ ss. to Oj., f $\frac{3}{4}$ j., or f $\frac{3}{4}$ ij.; of the tincture, f $\frac{3}{4}$ j. to f $\frac{3}{4}$ ij. Seldom given alone; frequently added to the infusion of cinchona.

MYRRH.—MYRRHA.

What is myrrh, and from what derived?

It is the concrete juice of the *Balsamodendron Myrrha*, a small tree growing in Arabia Felix.

What are the varieties of myrrh, and from whence are they imported?

There are two varieties: *India myrrh*, and *Turkey myrrh*; the former imported from the East Indies, the latter from the Levant.

What are the physical and chemical properties of myrrh?

Turkey myrrh, the purest and best variety, is in small irregular tears or masses, of a reddish-yellow color, translucent, brittle, and breaking with a shining fracture. It has a strong, peculiar odor, and a bitter, somewhat acid taste.

India myrrh is of a darker color, and often mixed with impurities. Myrrh consists, chiefly, of gum, resin and volatile oil. Water dissolves the gum only; alcohol the resin and volatile oil, its active ingredients, and consequently, is the best menstruum.

What are its medical properties and uses?

It is a stimulating tonic, with some tendency to the lungs. Used in debility, particularly when attended with excessive secretions from the mucous membranes, as chronic catarrh, humoral asthma, chronic diarrhœa, &c. Combined with the chalybeates, as in the form of *Misturi Ferri Composita*, it is much used in chlorosis, hysteria, and in the hectic fevers of phthisis and chronic catarrh; sometimes, combined with aloes, in amenorrhœa. Used externally as a stimulant application to spongy gums, aphthous ulcerations of the mouth, throat, &c.

ANGUSTURA BARK.—ANGUSTURA.

From what tree is this bark derived, and from whence imported?

It is obtained from the *Galipea officinalis*, a small tree growing in South America. It is brought from the West Indies, packed in casks.

What are its physical and chemical properties?

It is in pieces of various sizes, flat or slightly curved, with a soft yellowish-gray epidermis, of a yellowish-brown color, internally, and yields a pale-yellow powder. It has a peculiar, rather unpleasant odor, and a warm, bitter, somewhat acrid taste. Water and alcohol extract its virtues, which depend, chiefly, on a peculiar neutral bitter principle, named *cusparin*, and partly on a volatile oil.

What is the most important adulteration, and how may it be detected?

The bark of the *Strychnos Nux vomica*, formerly called *false Angustura*. This may be distinguished from the true bark, by its physical, as well as its chemical properties. It is thicker and heavier, covered with a motley-white epidermis, is without odor, and has an intense, very permanent bitter taste. It does not become soft, like the true *Angustura*, when steeped in water, and contains a poisonous, alkaline principle, called *brucia*. The best chemical test is nitric acid, which, when dropped on the internal surface, produces, in consequence of the *brucia*, a blood red spot, while it merely deepens the color of the true bark.

CASCARILLA.

What is cascarilla, and from whence imported?

The bark of the *Croton Eleutheria*, a small tree or shrub, growing in the West Indies, especially in the Bahama Islands; from one of which (*Eleutheria*,) it derived its name, and is chiefly imported.

What are its physical and chemical properties?

It occurs in short quills, or flattened pieces, of a reddish-brown color, covered with a grayish-white fissured epidermis. It has a warm, aromatic, bitter taste, and a peculiar, agreeable odor, which becomes very fragrant when the bark is burnt. Water and alcohol extract its virtues, which are dependent on extractive and volatile oil.

What are its medical properties and uses?

It is an aromatic tonic; given either alone, or combined with other more powerful tonics, in atonic dyspepsia—in the advanced stages of dysentery, diarrhœa, &c.

How is it administered, and what is the dose?

Given in powder and infusion. Dose of the former, 20 to 30 grains; of the latter, f ʒ ij.

3. AROMATICS.

What are these?

Substances which have a fragrant odor, and an agreeable, pungent taste.

To what do they owe their sensible and medical properties?

To *volatile oils*.

How are these obtained, and what are they called in the different Pharmacopœias?

Usually procured from the plants or substances containing them, by distillation with water. The oil and water pass over together, and the former collects at the bottom or on the surface of the latter, according to density. Called, in the U. S. and Lond. Pharmacopœias, *distilled oils*, from the mode of obtaining them; in the Dub. *essential oils*, from their possessing, in a concentrated state, the properties of the original plants; and in the Edin. *volatile oils*.

What are their physical and chemical properties?

They have a strong, penetrating odor, resembling that of the plants from which they are obtained, and a hot, pungent taste, which is often agreeable, when

sufficiently diluted. Most of them are lighter than water; are partially volatilized by ordinary temperatures, and completely so by heat; hence, decoctions and extracts of aromatics, are improper. Their boiling point is about 320°F ., but most of them rise with the vapor of boiling water. They are inflammable; burning in the open air, with a bright flame and much smoke. On exposure to the air, they gradually absorb oxygen, become thicker, less odorous, and of a deeper color, and are ultimately converted into a resinous substance. They are very sparingly dissolved by water; sufficiently, however, to impart to it their odor and taste. Their solubility in water is greatly increased by trituration with magnesia, as also by the intervention of sugar. They are soluble in alcohol and ether, and unite with the fixed oils, in every proportion. Their ultimate constituents are carbon, hydrogen and oxygen, but some, as the oils of turpentine and copaiba, when perfectly pure, consist of carbon and hydrogen, only.

What are the most common adulterations, and the modes of detecting them?

Adulterations: fixed oils, resinous substances, alcohol, &c. When a fixed oil is present, a greasy stain imparted to paper cannot be entirely removed by heat. The comparative insolubility of all the fixed oils, except castor oil, in alcohol, and their specific gravities, will also afford means of detection; and when the adulterated oil is distilled with water, any fixed oil or resinous substance will be left behind. If alcohol be present, the oil will become milky when agitated with water, and after the separation of the liquid, the water will occupy more space, and the oil less, than before.

What are the medical properties and uses of aromatics?

They differ from tonics, in general, in being more stimulant, but less permanent in their effects; closely resemble the diffusible stimulants, but more local in their action. Given, in the absence of inflammation,

to excite languid digestion, allay nausea, check vomiting, relieve spasmodic pains of the stomach and bowels, and to expel flatulence, in which latter case they are called *carminatives*. They are often employed as flavoring or corrective adjuncts of other medicines.

What are the substances belonging to this division ?

They are very numerous; the following are some of them :

ORANGE PEEL.—AURANTII CORTEX.

How many varieties of oranges are there ?

Two: the *sweet orange*, and the *bitter* or *Seville orange*; the former the fruit of the *Citrus Aurantium*, the latter, of the *C. Vulgaris*; two small evergreen trees, indigenous in Asia, and cultivated in almost all of the warmer regions of the globe.

What is the only officinal part, in the U. S. P. ?

The outer rind of the mature fruit.

What are the sensible properties of orange peel, and its relations to water and alcohol ?

It has a fragrant odor, and a warm, bitter taste, which depend upon an essential oil contained in minute vesicles. The rind of the Seville orange has a stronger odor, and a more bitter taste. Both yield their sensible properties to water and alcohol.

What are its medical properties and uses ?

It is stomachic, and slightly tonic; the rind of the bitter orange possesses these properties in a greater degree. Chiefly used in the form of infusion, or some of its officinal preparations, as the *confection* or *syrup*, to communicate a pleasant flavor to other medicines.

CINNAMON.—CINNAMOMUM.

What is this ?

The bark of the *Cinnamomum Zeylanicum*, and *C. aromaticum*, small trees growing in Ceylon, Java, Malabar, &c.

How is the bark prepared for market, and from whence is it imported?

It is removed from the three year old branches, by making opposite longitudinal incisions, and the epidermis, and green, pulpy matter are afterwards scraped off, and the smaller pieces introduced in the larger ones as they dry and contract into the form of quills. Chiefly imported from China; some from England, and from the East and West Indies.

What are the commercial varieties? *Garomatium*

Ceylon cinnamon, and *China cinnamon* & the latter commonly called *Cassia*.

What are the physical properties of the two varieties?

Ceylon cinnamon is in long rolls, composed of several quills, the smaller being enclosed within the larger; is nearly as thin as paper, has a smooth surface and a splintery fracture. It is of a brownish-yellow color, a pleasant, fragrant odor, and a warm, sweetish, slightly astringent taste.

China cinnamon differs from the above considerably; the quills are simple, the bark thicker, rougher, denser, and breaks with a shorter fracture. The odor is also less fragrant, and the taste more pungent.

What are its active ingredients?

A light and heavy volatile oil, and tannin.

What are the sensible properties of the oil?

It is of a light-yellow color at first, becoming deeper, and ultimately reddish, by age; has the odor of the bark, and a hotter, more pungent taste.

What are the medical properties and use of cinnamon?

It is an excellent aromatic, with some slight astringency. Much used as an adjuvant to other medicines, and enters into numerous officinal preparations.

What is the dose?

From 10 to 20 grains; added to infusions of other medicines, in the proportion of ʒj. or ʒij., to the pint.

Especially given with medicines for the

How is *cinnamon water*, *aqua cinnamomi*, prepared, and what is its chief use?

Prepared by rubbing oil of cinnamon, first with magnesia, and then with distilled water gradually added, and filtering through paper. Used as a vehicle for other less agreeable medicines.

What is the dose of the officinal tincture, and compound tincture of cinnamon?

From f 3 j. to f 3 iij.

CANELLA.

What is this?

The bark of the *Canella alba*, a native of the West Indies.

From what part of the tree is the bark obtained, and what are its physical properties?

Like cinnamon, it is derived from the branches and deprived of its epidermis. Comes in pieces partially or completely quilled, from a few inches to a foot or more in length, from one to three lines thick, and the quills from half an inch to an inch and a half in diameter. It is brittle, breaking with a short fracture, of a pale orange-yellow color, and affords a yellowish-white powder. Its odor is aromatic, and its taste warm and very pungent.

What are its relations to water and alcohol, and its active ingredients?

Its virtues, which are partially extracted by water, and completely by alcohol, depend on volatile oil and bitter extractive.

What are its medical uses?

Employed as an adjuvant to other more powerful tonics, and as a corrigent to purgatives, as in the *powder of aloes and canella*.

CLOVES.—CARYOPHYLLUS.

What are these?

The undeveloped flower-buds of the *Eugenia*

caryophyllata, a small, handsome evergreen tree, a native of the Molucca Islands, and cultivated in many parts of the East and West Indies.

What are the physical and chemical properties of cloves?

They resemble a nail, in shape, are about half an inch long, of a deep brown color, a strong aromatic odor, and a pungent, somewhat acrid taste. Water extracts their odor; alcohol the whole of their sensible and active properties, which depend on a volatile oil.

Oil of Cloves—Oleum Caryophylli. How is this prepared, and what are its physical properties?

Prepared by distilling cloves with water, repeated cohobation being required to exhaust them completely. It is at first colorless or yellowish, becoming reddish-brown by exposure, has the odor and taste of cloves, and is heavier than water.

What is the character of cloves, as an aromatic?

One of the most excitant aromatics.

How are they given, and what is the dose?

Given in powder, infusion and oil. Dose of the powder, from 5 to 10 grains; of the infusion, made with 3 ij. to Oj., f 3 ij.; of the oil, 2 to 5 drops.

NUTMEG.—MYRISTICA.

What is nutmeg?

The kernel of the fruit of the *Myristica moschata*.

What is the character of this tree, and its place of growth?

It is a small tree, from 20 to 30 feet high, resembling, somewhat, the orange tree. The fruit is oval, about the size of a peach, with a smooth covering, which at first is pale-green, thick and fleshy, becoming yellow, dry and coriaceous, when ripe, and separating from the apex into two valves, disclosing a yellowish or reddish reticulated membrane—the *mace* of commerce—closely investing a thin brown shell, which

contains the nutmeg. Its places of growth and culture are nearly the same as those of cloves.

How is the *mace* and *nutmeg* prepared for market?

The outside covering is rejected, and the mace then carefully separated, flattened and dried in the sun, and afterwards sprinkled with salt water, to preserve it. The nuts are dried in the sun, or in ovens, and exposed to smoke until the kernels rattle in the shells. These are then broken open and the kernels removed, steeped in a mixture of lime and water, to prevent the attack of worms, then cleaned and packed in casks for exportation.

What are the physical and chemical properties of nutmeg?

Its physical properties are well known. It contains a volatile and fixed oil, to the former of which it owes its virtues.

How is the *volatile oil* prepared, and what are its physical properties?

It is obtained by distillation with water; is colorless or yellow, lighter than water, with the fragrant odor, and warm, aromatic taste of nutmeg.

How is the *fixed oil* obtained, and what are its properties and uses?

This, which is commonly, though improperly, called *oil of mace*, is obtained by bruising the nutmegs in a heated mortar, and afterwards compressing them between heated plates; the liquid oil which flows out, acquires the consistence of a soft solid, on cooling, is of a yellowish color, with the slight odor and taste of nutmeg. Occasionally used as an external stimulant; enters into the rubefacient *Emplastrum Picis Compositum*.

What are the most interesting ingredients of mace?

A volatile and fixed oil, essentially the same as those of nutmeg.

What are the medical properties and uses of nutmeg and mace?

They possess aromatic and narcotic properties. Nutmeg much used for flavoring purposes.

What is the dose of each ?

Of the powder, obtained by grating, from 5 to 20 grains ; of the volatile oil, 2 or 3 drops.

BLACK PEPPER.—PIPER.

What is this ?

The dried, unripe berries of the *Piper nigrum*, a climbing, woody vine, native of India, and cultivated in the East and West Indies.

What is *white pepper* ?

The ripe berries, deprived of their teguments by maceration in water and subsequent friction.

What are the active principles of pepper ?

A peculiar crystalline principle, named *piperin*, an acrid, soft resin, and a volatile oil.

What are its medical properties and uses ?

It is an aromatic stimulant ; extensively used as a condiment ; as a medicine to excite languid digestion, and correct flatulence. Pepper or piperin sometimes a useful adjuvant to quinia in intermittents, especially where there is much insusceptibility of stomach, as in cases of drunkards.

What is the dose ?

Of pepper, from 5 to 20 grains ; of piperin, from 2 to 6 grains.

CUBEBS.—CUBEBA.

What are these ?

The dried berries of the *Piper Cubeba*, a vine growing in the East Indies.

What are their physical properties ?

They are about the size of black pepper, brownish externally, and have a small portion of the peduncle attached ; hence the name *Piper caudatum* has been applied to them. The shell is hard, and contains

within it a spherical seed, which is blackish externally, whitish and oily internally, has an aromatic odor, and a warm, bitterish and camphorous taste.

What is their active ingredient?

A volatile oil, obtainable by distillation.

What are the physical properties of this oil?

It is of a pale greenish-yellow color, with the peculiar odor and taste of the berries; lighter than water, and about the consistence of almond oil?

What are the effects of time and exposure, on cubebs?

They deteriorate, from the volatilization of their essential oil, which takes place more rapidly in the state of powder; consequently, they should be kept whole till wanted for immediate use.

What are their therapeutical effects and applications?

Their effects are those of a stimulant and carminative, but they also exercise a specific influence over the urinary organs, indicated by their effects in arresting urethral discharges, as in the case of gonorrhœa, for which complaint they are chiefly used.

What is the dose?

Of the powder, ʒj. to ʒij., 3 or 4 times daily; of the volatile oil, 10 to 20 drops.

PIMENTO.—PIMENTA.

What is this?

The dried, unripe berries of the *Myrtus Pimenta*, a beautiful tree growing in the West Indies, and particularly abundant in Jamaica; whence the name *Jamaica pepper*, by which it is sometimes called.

What are the physical properties of the berries?

They are small, round and umbilicated; of a brownish color, and an odor resembling a mixture of cinnamon, cloves and nutmeg; hence the name *allspice*, by which they are commonly called. Their taste is aromatic, pungent and slightly astringent.

What are their active ingredients ?

A volatile and fixed oil.

What is the color, odor and taste of the volatile oil ?

It is of a reddish-brown color, with the odor and taste of pimento, though stronger.

What are its uses ?

Employed in medicine, as an aromatic adjuvant to tonics and purgatives ; more used as a condiment.

What is the dose ?

From 10 to 40 grains of the powder, and from 3 to 6 drops of the oil.

CARDAMOM.—CARDAMOMUM.

What is this ?

The fruit of the *Alpinia Cardamomum*, a plant growing in Malabar.

What are the physical and chemical properties of the fruit ?

It consists of a yellowish-white, coriaceous capsule, with numerous reddish-brown seeds. Its odor and taste is agreeably aromatic. Its virtues are extracted by water, but more readily by alcohol. They depend on a volatile oil, which is more abundant in the seeds.

What are its medical properties and uses ?

It is among the most agreeable of the aromatics ; much used as an adjuvant or corrective of cordials, tonics and purgatives.

How is it used, and what is the dose ?

Used chiefly as an ingredient in compound preparations. The *compound tincture* is a very agreeable aromatic. Dose, f ʒj.

FENNEL SEED.—FÆNICULUM.

From what are these derived, and what are their physical properties ?

Derived from the *Anethum Fœniculum*, a perennial, herbaceous plant, indigenous in Europe, and cultiva-

ted in our gardens. The seeds are small, oval, flat on one side, convex on the other; of a brownish color, a fragrant odor, and a warm, sweetish, aromatic taste.

What are their relations to water and alcohol?

Hot water and alcohol extract their virtues, which depend on a volatile oil—*Oleum Fœniculi*.

How is this obtained, and what are its properties?

Obtained by distillation with water. It is colorless or yellowish, with the odor and taste of the seeds, and a sp. gr. of 0.997. It possesses the medical properties of the seeds, which are those of a grateful aromatic.

How is it given, and what is the dose?

Usually given in infusion, made with 2 or 3 drachms to the pint. Dose, from f ʒ ij. to f ʒ iv. Dose of the oil, from 5 to 15 drops.

LAVENDER.—LAVANDULA.

What is this?

The flowers of the *Lavandula vera*, a native of Southern Europe, and cultivated in our gardens.

What are the sensible properties of the flowers?

Their odor is strong and fragrant, their taste warm, bitterish and aromatic.

What is their active ingredient?

A volatile oil—*Oleum Lavandulæ*.

How is this obtained, and what are its chief uses?

Obtained by distillation with water; chiefly employed as a perfume; sometimes in the formation of the *spirit of lavender*, which is also mostly used as a perfume; enters into some officinal compounds.

In what form is lavender chiefly used in medicine?

In the form of the officinal *Compound Spirit of Lavender*.

What are the constituents of this preparation?

Spirit of lavender, spirit of rosemary, cinnamon, cloves and red saunders.

What are the medical uses of this?

It is much used to relieve nausea, flatulence and faintness, and as an adjuvant to other medicines.

What is the dose, and the best mode of administering it?

Dose, f 3 ss. to f 3 j., dropped on sugar.

ROSEMARY.—ROSMARINUS.

What is this?

The tops of the *Rosmarinus officinalis*, an ever-green shrub growing in the South of Europe, and cultivated in our gardens.

What is its active ingredient?

A colorless volatile oil.

How, and for what, is rosemary chiefly employed?

Used in the forms of the officinal *spirit* and *volatile oil*, to impart flavor and warmth to lotions and liniments.

PEPPERMINT.—MENTHA PIPERITA.

What is the officinal part?

The whole herb.

What is the character of the plant, and the place of growth?

It is a perennial, herbaceous plant, about two feet high, with small purple flowers, appearing in August. It is a native of Europe, and cultivated and naturalized in this country.

What are its sensible properties and relations to water and alcohol.

It has a grateful odor, and a warm, pungent, bitterish taste, leaving a sense of coolness in the mouth, during inspiration. Its virtues, depending upon a volatile oil, are extracted by water, but more readily by alcohol.

Oil of peppermint—*Oleum Menthae Piperitæ*.
How is this obtained, and what are its physical properties?

Obtained by the usual process of distillation. It is lighter than water, and of a greenish-yellow color, with the odor and taste of the plant.

What are the medical properties and uses of peppermint?

It is a very grateful, aromatic stimulant; much used in nausea, flatulence, spasmodic pains in the stomach and bowels, and to cover the taste and correct the nauseating and griping tendencies of other medicines. The fresh herb bruised and applied over the epigastrium often useful in allaying sick stomach, especially in the cholera of children.

How is it given, and what is the dose?

It may be given in infusion; but the oil, or *essence of peppermint*, prepared by dissolving f ʒ ij. of the oil in Oj. of alcohol, is usually preferred. Dose of the oil, 1 to 3 drops, on sugar; of the essence, 10 to 20 drops.

How is *peppermint water*, *Aqua Menthæ Piperitæ*, prepared, and what are its uses?

Prepared like cinnamon water, carbonate of magnesia being substituted for the magnesia. Chiefly used as a vehicle for other medicines.

SPEARMINT.—MENTHA VIRIDIS.

What are the medical properties and uses of this?

Common mint possesses the same virtues as the above, and may be used for the same purposes, and in similar ways and doses.

GINGER.—ZINGIBER.

What is this?

The root of the *Zingiber officinale*, a perennial herb, indigenous in the East Indies, and cultivated in the West Indies.

How is it prepared for market, and what are the commercial varieties?

The root is dug up in January and February, after the stem has withered, cleaned, scalded to prevent germination, and then dried. As thus prepared it constitutes ordinary ginger, called in commerce, *black ginger*, from the darkish color of its surface; sometimes also, *East India ginger*, from its origin. In Jamaica, the best roots are sometimes deprived of their epidermis and carefully dried in the sun, without being scalded. This is called *white ginger*, or more frequently *Jamaica ginger*, and is more highly prized.

What are its sensible properties, and the effects of time and exposure on these?

Ginger has a peculiar aromatic odor, and a hot, pungent, biting taste, which are gradually diminished, and ultimately destroyed by exposure.

What are its constituents, and its relations to water and alcohol?

It contains a volatile oil, an acrid soft resin, extractive, starch, &c. Its virtues depend upon the two first, and are extracted by water and alcohol.

What are its medical properties and uses?

It is an aromatic stimulant, much used to impart warmth and flavor to other medicines. As a local stimulant, it is chewed in paralysis of the tongue, relaxation of the uvula, &c. The powder, made into a paste with boiling water, and spread on linen, sometimes applied externally, as a rubefacient.

How is it used, and what is the dose?

Used in powder, infusion and syrup. Dose of the powder, from 10 to 30 grains; of the infusion, made with \mathfrak{z} j. to Oj., f \mathfrak{z} ij.; of the tincture, f \mathfrak{z} j. or f \mathfrak{z} ij. The syrup used chiefly for flavoring.

SWEET FLAG.—CALAMUS.

What is this officinally?

The root of the *Acorus Calamus*, an indigenous plant.

What are the sensible properties of the root, and its relations to water and alcohol?

It has a strong, fragrant odor, and an aromatic, bitter taste. Boiling water and alcohol extract its virtues.

What are its medical properties and uses?

It is an aromatic stimulant; given as a stomachic and carminative in atonic conditions of the digestive organs, and as an adjuvant to tonics and purgatives.

What is the dose?

Of the powder, from ℥j. to ʒj.; of an infusion, made with an ounce of the root to a pint of boiling water, f ʒ ij. or more.

2. *Mineral Tonics.*

IRON.—FERRUM.

What are the therapeutical effects and applications of iron.

In the form of its various preparations, it is tonic and astringent in its general effects; but when given in too large doses, or for too long a period, the preparations of iron produce a state of over excitement, characterized by a feeling of determination of blood to the head, of general fulness, and by other unpleasant sensations. They are chiefly used for their tonic properties, and are applicable in cases of debility, especially when accompanied with, or dependent on, anæmia, in which the blood is deficient both in quantity and in the relative proportion of its red particles. Chlorosis, hysteria, amenorrhœa, fluor albus, gleet, scrofula, rickets, chorea, neuralgia, passive hemorrhages, and dyspepsia, when dependent on deficient energy of the digestive functions, are some of the diseases in which they are used.

What circumstances contra-indicate their use?

They are improper where there is any tendency to inflammation or active hemorrhage in the system; in irritability of the digestive organs; in persons of full

habit, and in those prone to determination of blood to the head.

How do they affect the stools?

They render them darker, less frequent, and more solid.

What are the officinal preparations of iron?

They are numerous; the following are some of them:

Iron Filings.—*Ferri Ramenta.* Whence are these obtained, and how purified?

Generally obtained from the shops of the blacksmith, in an impure state, and purified, according to the Edinburgh College, by placing a seive over them and applying a magnet so that the filings may be attracted upward through it.

What are their effects on the system?

In their metallic state they are nearly inert, but acquire tonic virtues by oxidation in the stomach. But little used.

What is the dose?

From 5 to 20 grains, in molasses or honey.

Scales of Iron.—*Ferri Squamæ.* How are these prepared and purified?

They are found collected around the anvil of the blacksmith, produced by heating and hammering iron. These are washed with water, dried and separated from impurities by a magnet. They are then pulverized, and a fine powder obtained by elutriation.

What is the color of the powder, and its chemical nature?

It is of a dull grayish color, and is supposed to consist of protoxide, sesquioxide, and metallic iron, in varying proportions.

What is the dose?

From 5 to 20 grains.

Subcarbonate of Iron.—*Ferri Subcarbonas.* How is this prepared, and what is its chemical nature?

This preparation, which is also called *Carbonate of Iron*, *Sesquioxide of Iron*, and *Red Oxide of Iron*, is

prepared as follows: *Solutions of sulphate of iron and carbonate of soda* are separately formed with boiling water, then mixed and the mixture set by, that the precipitate may subside. This is washed with hot water and dried. When the above solutions are mixed, a double decomposition ensues: sulphate of soda and protocarbonate of iron are formed, the former remaining in solution, and the latter precipitating. This, however, absorbs oxygen with the disengagement of carbonic acid, during the process of drying, and becomes converted almost entirely into *sesquioxide of iron*.

What are its physical properties and chemical relations?

It is a reddish-brown powder, with a styptic taste; insoluble in water, but soluble in water with carbonic acid, and readily so in muriatic acid, with slight effervescence of carbonic acid.

What are its therapeutical uses?

It is considered one of the best chalybeates, and is used for most purposes to which they are generally applied. Mr. Carmichael found it a useful palliative in cancer, and Mr. Hutchinson, an efficient remedy for neuralgia.

What is the dose and mode of administration?

Ordinary dose, from 5 to 20 grains; in neuralgic cases, 3 ss. to 3 j., 3 times daily, and gradually increased. Given in pill or powder, and should it disagree with the stomach, an aromatic may be added.

What is the composition and character of *Vallet's Ferruginous Pills*?

They consist of *protocarbonate of iron*, incorporated with *honey*, by which the absorption of oxygen is prevented, and the protocarbonate rendered permanent. Where the alterative effects of iron are desired, they are considered equal, if not superior, to any other preparation of that metal.

What is the dose of the pills?

Each pill weighs 3 grains, and contains somewhat

less than gr. $1\frac{1}{2}$ of the protocarbonate; therefore, 8 or 10 pills may be given daily.

Sulphate of Iron.—*Ferri Sulphas.* What is this commonly called?

Green vitriol, in commerce, *copperas*.

How is it prepared, and what are its physical and chemical properties?

It is obtained, in an impure state, for the purposes of the arts, by exposing the native protosulphuret, or iron pyrites, to the combined agency of air and moisture, for sometime, and lixivating. For medical purposes, it is formed by the action of *dilute sulphuric acid* on *iron wire* or *iron filings*. Obtained in the latter way, it is in large, transparent, bluish-green crystals, which effloresce on exposure to the air, absorb oxygen, and become covered with a brownish-yellow crust of the sulphate or subsulphate of the sesquioxide. It has an acid, disagreeable, styptic taste; is insoluble in alcohol, soluble in cold, and more so in boiling water; and the solution, on standing for sometime, exposed to the air, lets fall a precipitate of the disulphate of the sesquioxide. Exposed to a moderate heat, the crystalized sulphate undergoes the aqueous fusion, becomes dry and white, and at a red heat, it is decomposed; sulphuric acid is driven off, and the red sesquioxide is formed and remains. When pure, it consists of 1 eq. of the acid, 1 of the protoxide, and 7 of water.

What are the incompatibles?

The alkalies and their carbonates; soaps, lime-water, nitrate of silver, the acetates of lead, astringent vegetable infusions, &c.

What are its medical properties and uses?

It is tonic and astringent. In very large doses it acts as an irritant, occasioning nausea and vomiting, and griping in the bowels. Given in passive hemorrhages, colliquative sweats, atonic mucous discharges, &c.

What is the dose?

From 1 to 5 grains of the crystalized; of the dried,

(*Ferri Sulphas exsiccat*us, E.) which is more convenient for internal use, from gr. ss. to gr. iij. Given in pill.

What are the constituents of the officinal *compound mixture of iron*?

Its most important ingredient, when recently and properly prepared, is *protocarbonate of iron*, which results from the re-action of sulphate of iron on carbonate of potassa, salts used in its preparation. It contains, also, *myrrh*, *spirit of lavender*, *rose water*, and *sugar*.

What are its medical uses?

This preparation, an imitation of *Griffith's Mixture*, is considerably used as a tonic, in cases of debility, associated with derangement of the menstrual function.

Tincture of Chloride of Iron.—*Tinctura Ferri Chloridi*. What is the mode of preparation?

This, which was formerly officinal, under the title of *Tinctura Ferri Muriatis*—*Tincture of Muriate of Iron*, is prepared by pouring *muriatic acid* (Oj,) on *subcarbonate of iron*, (℥ss,) and allowing the mixture to stand for 3 days, then pouring off the liquor from the dregs, if there be any, and adding *alcohol*, (Oii.)

What are its physical and chemical properties?

It is of a reddish-brown color; has an acid, very styptic taste, and the odor of muriatic ether. It contains sesquichloride of iron, held in solution by the alcohol, and also, free muriatic acid, and a trace of muriatic ether.

What are its remedial uses?

Being a very efficient chalybeate, and usually acceptable to the stomach, it is much used in all cases in which they are indicated: sometimes employed externally to destroy venereal warts, and as a styptic to cancerous and fungus ulcers.

What is the dose and mode of administration?

Dose, from 10 to 30 minims, which may be gradually increased to f ʒ j. or f ʒ ij. Given in water or in white wine, nothing forbidding the use of the latter.

Hydrated Oxide of Iron.—*Ferri Oxidum Hydratum*. How is this prepared, and what is its chief use?

Prepared by adding nitric acid to a boiling solution of crystalized sulphate of iron, acidulated with sulphuric acid, so long as orange fumes (*nitrous acid vapors*,) are disengaged; then filtering the liquor and precipitating by an excess of ammonia. The hydrated sesquioxide, which is thrown down as a yellowish-brown precipitate, is carefully washed by decantation to free it from sulphuric acid; and as it is chiefly used as an antidote to arsenic, and is most efficacious as such, in the moist state, it should be kept in well stopped bottles, covered with water. A hydrated sesquioxide of iron may be also readily prepared by precipitating the tincture of chloride of iron with ammonia.

What is the dose, and mode of administering it as an antidote?

To convert arsenic into the insoluble and inert arsenite of iron, it requires at least 12 parts of the oxide to 1 of the poison; but as the antidote is perfectly innocent, it should be given in as large doses as the stomach will bear; say a table-spoonful mixed with water, every 5 or 10 minutes.

Tartrate of Iron and Potassa.—*Ferri et Potassæ Tartras*. How is this prepared?

By digesting *hydrated sesquioxide of iron* in a moist state, in a solution of *bitartrate of potassa*. The sesquioxide neutralizes the excess of acid in the bitartrate, so that a double salt of tartrate of sesquioxide of iron and potassa results. The liquid containing it is filtered, and evaporated to dryness.

What are its properties?

It is in the form of a greenish-brown powder, devoid of smell, but of a styptic, sweetish taste. It deliquesces slightly in the air, and is entirely soluble in water, forming a solution of considerable permanence. It is a chalybeate tonic, well adapted for children, on account of its not unpleasant taste.

What is the dose and mode of administration?

Dose, from 10 to 30 grains, made into a bolus, with honey or treacle, or dissolved in some aromatic water.

Phosphate of Iron.—*Ferri Phosphas.* What is the mode of preparing this?

A solution of sulphate of iron and of phosphate of soda, is made and mixed; when, by an interchange of their proximate constituents, sulphate of soda and phosphate of iron are formed; the former remains in solution, while the latter subsides. This is washed with hot water, and dried with a moderate heat.

What are its physical and chemical properties?

It is in the form of a light, slate colored, insoluble powder, consisting, it is said, of a mixture of the phosphates of the two oxides of iron.

What are its medical properties and uses?

It possesses the general properties of the chalybeates, but is not much used.

What is the dose?

From 5 to 10 grains.

The *Ferrocyanuret of iron*, *Acetate of iron*, *Ammoniated iron*, *Lactate of iron*, *Tartrate of iron*, and *Iodide of iron*, are also occasionally employed in medicine.

SULPHATE OF COPPER.—CUPRI SULPHAS.

How is this prepared?

Sulphate of Copper, sometimes called *Blue Vitriol* and *Bluestone*, is generally prepared, in this country, on the large scale, by the action of sulphuric acid on old scrap copper.

What are its physical and chemical properties?

It is a blue crystalline powder, soluble in water, forming a blue solution. It is a powerful astringent, and is used in the treatment of hemorrhages, and in the preparation of various medicines.

It occurs in large rhomboidal prismatic crystals of a rich blue color, and a strong styptic, metallic taste. It is insoluble in alcohol, but soluble in cold and more so in boiling water. The crystals consists of 1 eq. of sulphuric acid, 1 of protoxide of copper, and 5 of water. Exposed to the air, they effloresce slightly; to heat, they first melt in their water of crystalization, and then become dry and white. Decomposed by a red heat, with the escape of the acid.

What are the incompatibles?

The alkalies and their carbonates; acetate of lead; nitrate of silver; nearly all the salts of iron; astringent vegetable infusions, &c. The precipitate thrown down by ammonia, from an aqueous solution of this salt, is immediately re-dissolved when that alkali is added in excess.

What are its effects on the system?

In small doses, it is tonic and astringent; in large doses, a prompt emetic, and in excessive ones, an irritant and corrosive poison.

How are its poisonous effects best counteracted?

Albumen, as the whites of eggs diffused in water, should be freely given to neutralize the poison, or if this cannot be had, copious draughts of some bland liquid should be taken, and vomiting excited by tickling the throat with a feather: if this should fail to produce emesis, the stomach-pump may be resorted to.

What are its therapeutical applications?

As a tonic, it has been given in intermittent fever, and in some affections of the nervous system, as epilepsy and chorea; as an astringent, in chronic diarrhoea and dysentery. Externally, a solution of sulphate of copper is used as a stimulant to indolent and ill-conditioned ulcers; as a collyrium, in chronic ophthalmia, and as an injection, in chronic mucous discharges from the urethra or vagina. It is also used as an escharotic for destroying warts, fungus, and the callous edges of ulcers.

What is the dose and mode of administration?

Dose as a tonic, gr. $\frac{1}{4}$ or gr. $\frac{1}{2}$, in the form of pill ; for a lotion, from 2 to 10 grains, to f $\frac{3}{4}$ j. of water ; for an injection, from 1 to 4 grains, to f $\frac{3}{4}$ j. of water.

AMMONIATED COPPER.—CUPRUM AMMONIATUM.

What are the directions for preparing and preserving ammoniated copper?⁶³

Sulphate of Copper and Carbonate of Ammonia,⁴³ are directed to be rubbed together in a glass mortar till the effervescence ceases, and the ammoniated copper which results to be wrapped in bibulous paper, dried with a gentle heat, and kept in a well stopped glass bottle. *See, note. Sulphate of ammonia*

What are its physical and chemical properties ?

It is of a fine azure-blue color, with an ammoniacal odor, and a styptic, metallic taste. The changes which take place in its formation, and its precise composition are not certainly known. It is soluble in water ; exposed to the air, ammonia escapes and the powder changes to green.

What substances are incompatible with it ?

Acids, potassa, soda and lime-water.

What are its medical properties and uses ?

In small doses, it is tonic ; in over doses, an irritant poison. It has been used principally in spasmodic affections, as epilepsy, chorea, &c. *The best remedy in epilepsy*

What is the dose and mode of administration? *in combination*

Dose, gr. ss., twice a day, and gradually increased to 4 or 5 grains. Best given in the form of pill. *See note on page 84*

SULPHATE OF ZINC.—ZINCI SULPHAS.

How is this formed ?

By the action of sulphuric acid, diluted with water, on metallic zinc. The water is decomposed, the oxygen combining with the zinc to form the basis of the salt, and its hydrogen escaping with effervescence.

What are its physical and chemical properties ?

Sulphate of zinc, called in commerce *white vitriol*,

is a white, transparent, crystalized salt, bearing considerable resemblance to sulphate of magnesia. It is inodorous, but has a disagreeable, metallic, styptic taste. Pure crystalized sulphate of zinc, consists of 1 eq. of sulphuric acid, 1 of oxide of zinc, and 7 of water.

It effloresces in dry air; heated, it first melts in its water of crystalization, then parts with it, and at an intense heat is decomposed. It is soluble in $2\frac{1}{2}$ parts of cold water, and in less than its weight of boiling water: insoluble in alcohol.

What are the incompatibles?

The alkalies and their carbonates; lime-water; acetate of lead, and nitrate of silver.

What are its medical properties and uses?

It is tonic, astringent, and in large doses, a prompt emetic. As a tonic, it has been used in dyspepsia, and occasionally in obstinate intermittents, generally associated with cinchona or sulphate of quinia; but it is in spasmodic diseases, such as epilepsy, chorea, pertussis, &c., that it is mostly employed internally. It is frequently used externally for its astringency, as a styptic to bleeding surfaces, a collyrium, in chronic ophthalmia, and as an injection, in fluor albus, gleet and gonorrhœa. A strong solution, ($\text{℥} \text{ij.}$, to $\text{f} \text{℥} \text{viij.}$ of water,) has been used with success in nasal polypi, applied by means of lint and by injection.

What is the dose?

As a tonic, 1 or 2 grains, in pill; as a topical application to mucous surfaces, solution made in the proportion of 1 to 3 grains or more, to the fluidounce of water; as a wash to ulcers and external inflammations, from 10 to 20 grains to the fluidounce.

ACETATE OF ZINC.—ZINCI ACETAS.

How is this prepared?

Prepared, according to the U. S. Phar., by placing metallic zinc in a solution of acetate of lead, and allowing it to remain till the zinc takes the place of the

lead. But it is usually formed by the changes which take place when solutions of sulphate of zinc and acetate of lead are mixed. The acetate of zinc remains in solution, and is obtained in the form of white, silky crystals, by evaporation.

What are its sensible and chemical properties?

It is inodorous, but has a bitter, styptic taste; is very soluble in water, slightly efflorescent in dry air, and consists of 1 eq. of acetic acid, 1 of oxide of zinc, and 7 of water.

What are its medical uses?

It is used only externally, as a topical astringent, in ophthalmia and in chronic mucous discharges, as in gonorrhœa, &c.

What is the proper strength of a solution for such purposes?

It may be made in the proportion of from 1 to 4 grains or more, to the fluidounce of distilled water.

OXIDE OF ZINC.—ZINCI OXIDUM.

How is this prepared, and what are its properties?

It is precipitated from a solution of sulphate of zinc, by aqua ammoniæ. It is in the form of a white, insoluble powder, without odor or taste. It possesses tonic, astringent and antispasmodic properties.

What are its therapeutical applications?

It is given in epilepsy, chorea, hooping-cough, gas-trodynia, &c. Externally, it is used in the form of powder, or more frequently in that of ointment, (unguentum zinci oxidi,) as an exsiccant and mild astringent application to slight excoriations, superficial ulcerations, ophthalmia, tarsi, &c.

What is the dose and mode of administration?

Dose, from 2 to 8 grains, several times a day, in the form of a pill.

CARBONATE OF ZINC.—ZINCI CARBONAS.

What is the source of this, and mode of preparing it for medical uses?

*Turner's
Cerate*

Carbonate of Zinc, or *Calamine*, occurs native in compact, or earthy masses, and is directed to be calcined with a red heat, and reduced to a fine powder in the same manner as prepared chalk. It then constitutes *prepared carbonate of zinc*, *Zinci Carbonas Præparatus*, of the U. S. Phar.

What are the physical and chemical properties of this?

It is usually in the form of a heavy, insoluble, flesh-colored powder, without odor or taste. It is an impure oxide of zinc, nearly all of the carbonic acid having been driven off by the roasting.

What are its medical uses?

It is used only externally, as a mild astringent and desiccant to excoriated and ulcerated surfaces. The powder is dusted on the part, or more frequently applied in the form of cerate. *Ceratum Zinci Carbonatis*, commonly called *Turner's Cerate*.

SUBNITRATE OF BISMUTH.—BISMUTHI SUBNITRAS.

What are the synonymes?

Trisnitrate of Bismuth, *White Bismuth* and *Magistery of Bismuth*.

How is it prepared, and what is its chemical nature?

Prepared by dissolving bismuth in dilute nitric acid, and pouring the solution into distilled water. The metal is oxidized in the first part of the process, at the expense of part of the nitric acid, while the remaining acid forms with it, a nitrate of bismuth, which, on the addition of the water, is converted into a supernitrate and subnitrate, the former remaining in solution, and the latter precipitating. It consists of 1 eq. of nitric acid, and 3 of protoxide of bismuth.

What are its sensible properties?

It is an insipid, inodorous, white powder, with a pearly lustre; sold by the perfumers, as a cosmetic, under the name of *pearl white*.

What are its therapeutical effects and uses?

In medicinal doses, its effects are those of a tonic *in dyspepsia* and antispasmodic, for which it has been used in various nervous and spasmodic affections, and in painful derangements of the stomach, as in cardialgia, pyrosis and gastrodynia. Its use blackens the stools. In over doses, it acts as an irritant poison, causing inflammation of the stomach and bowels.

What is the dose and mode of administration?

Dose, from 5 to 20 grains; given in pill, or electuary.

NITRATE OF SILVER.—ARGENTI NITRAS.

How is this prepared?

By dissolving thin plates of silver in dilute nitric acid. Part of the acid is decomposed into nitric oxide and oxygen, the former escaping and becoming nitrous acid vapor, with the oxygen of the air, while the latter oxidizes the silver. The oxide combines with the remainder of the acid to form the nitrate in solution, which is deposited in transparent, tabular crystals, on evaporation and cooling. The salt obtained by evaporating the solution to dryness, melted and cast into cylindrical sticks or rods, constitutes *Lunar Caustic*, which is directed to be wrapped in white paper, and kept in well stopped bottles.

What are the physical and chemical properties of nitrate of silver?

It is kept in the shops in the form of sticks or pencils, and in the state of crystals. The sticks are about the thickness of a quill, brittle, breaking with a crystalline fracture, of a grayish color, inodorous, and of an austere, metallic taste. They are often impure, containing nitrate of copper, which causes them to deliquesce, and frequently traces of gold. The crystals are generally purer, and consequently, better suited for internal use. They are officinal only in the Dub. Pharm. Nitrate of silver is an anhydrous salt, consisting of 1 eq. of nitric acid, and 1 of oxide of silver. It is not deliquescent when pure, is soluble in its weight

of cold water, and in four times its weight of boiling alcohol. Exposed to the light, it becomes blackish; to heat, it fuses, and at a red heat, is decomposed, the acid being expelled, and the oxide reduced.

What are the incompatibles?

Spring and river water; soaps, the fixed alkalies and their carbonates; lime-water; muriatic, sulphuric and tartaric acids, and their soluble salts; the soluble chlorides; hydrosulphuric acid gas; solution of arsenite of potassa; astringent vegetable infusions, &c.

What are its effects on the system?

In small doses, frequently repeated, it acts as a tonic and antispasmodic, but if too long continued, it is apt to weaken the stomach, and impart a leaden hue to the skin, which is very difficult to be removed, but is said to yield to a steady course of cream of tartar. In large doses, it acts as a corrosive poison. Applied externally, moistened or dissolved in distilled water, it stains the skin black, and may be made to act as a stimulant, vesicant, or escharotic.

What are its therapeutical applications as a tonic?

Given in some forms of dyspepsia; in angina pectoris, epilepsy, chorea, &c.

What is the proper treatment for the poisonous effects of this salt?

The best antidote is a solution of common salt, which converts the nitrate into the insoluble, and therefore inert chloride of silver. Consecutive inflammation combated upon general principles.

What is the dose and mode of administration?

Dose, gr. $\frac{1}{8}$, gradually increased to 2 or 3 grains, three times daily. It is best given in pill, made with some vegetable extract, as that of gentian or chamomile, and not with crumb of bread, when this contains common salt. Its use should not be continued longer than two or three months at a time, for reasons before stated.

SULPHURIC ACID.—ACIDUM SULPHURICUM.

How is this prepared?

It is prepared, on the large scale, by burning sulphur with nitre in a leaden chamber, fitted for the purpose.

What are its physical properties?

Sulphuric acid, or *oil of vitriol*, as it is frequently called, is a dense, colorless, oily-looking liquid, inodorous, with an intensely acid, burning taste. Its sp. gr., when pure, is about 1.845.

With what substances is it incompatible?

With most metals and their oxides; earths, alkalies and their carbonates; with most salts, supplanting their acids; with alcohol, converting it into ether; and with all organic substances, charring and destroying them.

What are its effects on the system?

It is a powerful corrosive poison, destroying the animal tissues wherever it comes in contact with them. Properly diluted, it is tonic, refrigerant and astringent.

What is the proper treatment in poisoning with it?

Magnesia or its carbonate should be immediately given to neutralize the acid, or if these are not at hand, a solution of soap may be substituted and followed by the free use of bland and mucilaginous drinks.

What are its therapeutical applications, both internal and external?

It is applicable in low typhoid fevers; in cases of debility, especially when attended with excessive discharges, as in passive hemorrhages, colliquative sweats and diarrhœas, and in cases of phosphatic depositions from the urine. Externally, it is used largely diluted, as a wash to foul and indolent ulcers and some cutaneous eruptions. It is also used as an ingredient in gargles for ulcerated sore throat, and for checking excessive ptyalism, but is apt to injure the teeth.

How is it used?

Never used, in its concentrated state, except as a caustic.

The following forms are officinal :

Diluted Sulphuric Acid.—*Acidum Sulphuricum Dilutum.* What is the strength of this preparation, and the dose and mode of administering it?

Diluted in the proportion of f ʒj. of the strong acid, to f ʒ xij. of distilled water. Dose, from 10 to 30 drops, three times a day, in a wine-glassful of sweetened water, sucked through a quill, to avoid injuring the teeth.

Aromatic Sulphuric Acid.—*Acidum Sulphuricum Aromaticum.*—*Elixir of vitriol.* What are the constituents and sensible properties of this preparation?

It consists of sulphuric acid, alcohol, and the essential oils of cinnamon and ginger. It is of a reddish-brown color, a peculiar, aromatic odor, and of an agreeable acid taste, when sufficiently diluted. The form most usually prescribed, as a tonic.

What is the dose and mode of administration?

Same as the preceding.

Ointment of Sulphuric Acid. How is this prepared, and what are its uses?

Made in the proportion of f ʒj. of acid, to ʒj. of lard. Applied in scabies, ringworm, &c.

NITRIC ACID.—ACIDUM NITRICUM.

How is this acid prepared, and what are its physical properties?

Prepared by the action of sulphuric acid on nitrate of potassa. It is a dense, colorless liquid, when pure, of a strong disagreeable odor, an intensely acid, caustic taste, and of the sp. gr. 1.5; but it is never as strong as this in the shops, and is often of an orange hue, owing to the presence of nitrous acid.

What are the incompatibles?

The alkalies; earths, some metals, and many oxides;

sulphate of iron ; acetates of lead and potassa ; alcohol, and all the carbonates and sulphurets.

What are its effects on the system ?

Sufficiently diluted, it acts as a tonic refrigerant and antiseptic ; concentrated, as a corrosive poison.

What is the treatment for its poisonous action ?

Antidote, magnesia or its carbonate, conjoined with demulcent and emollient drinks.

What are its remedial applications, both internal and external ?

Used as a tonic, principally in the treatment of chronic hepatitis, and sometimes of secondary syphilis, either as an adjuvant to mercury or to remove the ill-effects of that metal on the system. Largely diluted with water, sometimes useful as a drink in febrile diseases, especially in typhus. Externally, the concentrated acid sometimes employed as a caustic in the destruction of warts and corns, and the surfaces of poisoned wounds and phagedenic ulcers. A lotion, made in the proportion of xij. minim to Oj. of water, applied as a stimulant and alterative to indolent ulcers, and in the form of an ointment to some eruptive diseases. In the state of vapor, it was considerably employed as a disinfecting agent before the introduction of chlorine and its chlorides of lime and soda for that purpose.

What is the dose and mode of administration ?

Dose of the strong acid, from 5 to 10 minims ; of the *diluted*, from f3 ss. to f3 j. Each given in a wine-glassful or more of water, and repeated 3 or 4 times a day.

MURIATIC ACID.—ACIDUM MURIATICUM.

By what other names is this called ?

Sometimes called *liquid muriatic acid*, *chlorohydric acid*, and *hydrochloric acid*.

How is it prepared, and what are its physical properties ?

It is prepared by the manufacturing chemist, on a large scale, by subjecting a mixture of sulphuric acid and chloride of sodium to distillation, and condensing the chlorohydric acid gas in water, contained in a suitable receiver. It is a limpid, colorless liquid, when pure, usually of a yellowish tinge, due to the presence of iron or organic matter, with a suffocating odor, and an intensely acid, corrosive taste. The sp. gr. of the officinal acid is 1.16.

What are the incompatibles?

The alkalies; tartar emetic; acetate of lead; nitrate of silver; all the carbonates, &c.

What are its medical properties and uses?

It is tonic, refrigerant and antiseptic. Employed in diseases with septic tendencies, as in typhoid and petechial fevers, malignant scarlatina, phagedenic ulceration of the throat, scurvy, &c. Also used in debility of the digestive organs, attended with phosphatic deposits from the urine, and to prevent the generation of worms in the bowels.

What is its poisonous action, and how best counteracted?

A corrosive poison; best antidotes, magnesia, chalk, or a solution of soap may be substituted, and demulcent drinks largely given.

What is the dose and mode of administration?

Dose, from 5 to 20 drops, several times a day, in 3 or 4 fluidounces of sweetened water. For a gargle, f ʒj. or f ʒij. to f ʒvj. of water.

NITRO-MURIATIC ACID—ACIDUM NITROMURIATICUM.

How is this prepared, and what are its physical and chemical properties?

Prepared by mixing nitric and muriatic acids in the ratio of one measure of the former to two of the latter. It has a deep-yellow color, an intensely acid taste, and exhales the odor of chlorine and nitrous acid. It is a solution of chlorine and nitrous acids in water, resulting

from the mutual decomposition of the acids, the hydrogen of the muriatic parting with its chlorine to form water, with one eq. of oxygen of the nitric. It has been long known under the name of *aqua regia*, for its peculiar property of dissolving gold and platinum.

What circumstance may prevent the above changes from taking place, when nitric and muriatic acids are mixed, and how may it be obviated ?

Prevented by the weakness of the acids, as occasionally sold in the shops ; obviated by the addition of a little sulphuric acid, which, by its superior attraction for water, concentrates the other acids and effects the reaction. This may be known to have taken place, by the color and odor of the mixture, together with its power to dissolve gold-leaf.

What are its remedial applications ?

It is used, chiefly, externally, as a remedy in chronic hepatic affections, syphilis, and some cutaneous diseases.

How is it applied ?

In the form of a foot-bath, and by sponging the body with it, in a diluted state. The bath, prepared by mixing $\text{f } \frac{3}{4}$ ivss. of the acid, with cong. iij. of water, at 96°F . in a deep wooden vessel, and the feet immersed in it for 20 or 30 minutes, daily ; strength for sponging, $\text{f } \frac{3}{4}$ j. to cong. j. Thus employed, it produces a tingling sensation in the skin, and occasionally salivation and soreness of the gums, after its use has been continued for sometime. It has been used also, internally, in the same affections, in the dose of from 5 to 10 drops, 2 or 3 times a day, largely diluted with water.

III. ARTERIAL STIMULANTS.

What are these ?

Medicines which excite, most prominently, the circulation.

To what cases are they applicable and inapplicable ?

They are applicable to cases of great prostration, when the natural powers of the system are sufficient to sustain it, when raised ; otherwise, they impair the vital energies, and increase the debility they are given to remove. Inapplicable, as a general rule, to febrile and inflammatory affections. Sometimes useful, however, in such cases, when there is great depression of the vital actions, and especially in the suppurative and gangrenous stages of inflammation. They are improper in hypertrophy of the heart, and in recent cases of paralysis, particularly when the encephalon is in fault ; also, in prostration from concussion of the brain, and in the chills of fevers, as there is danger to be apprehended from the subsequent re-action. In such cases, they should be administered with great caution, and only when essential to life ; external stimulation being preferable.

What are the individuals composing this class ?

Numerous substances possess stimulant properties ; but those which, in their general effects, excite more especially the heart and arteries, are : cayenne pepper, oil of turpentine, carbonate of ammonia, and phosphorus.

CAYENNE PEPPER.—CAPSICUM.

What is officinal capsicum.

The fruit of the *Capsicum annuum*, an annual, herbaceous plant, cultivated in this country.

What are the physical and chemical properties of the fruit ?

It is a long, pointed, pendulous pod, with a smooth, shining surface, of a bright-red color, when ripe. Internally, it consists of a dry, loose pulp, with numerous flat, kidney-shaped, whitish seeds. When pulverized, it constitutes *red pepper*, or *cayenne pepper*, which is of a reddish-yellow color, becoming paler on exposure. It has an aromatic, pungent odor, and an acrid, burning taste. Water and alcohol extract its virtues, which depend upon an acrid principle called *capsicin*.

What are its medical properties, and remedial applications.

It is a powerful stimulant, its general influence, though, not proportionate to its local action. Much used as a condiment in tropical climates, to correct the flatulent tendency of certain vegetable articles of food, and to facilitate their digestion. As a medicine, it is used in cases of dyspepsia, which depend on feeble and languid digestion, such as occur in atonic gout, and in habitual drunkards. Sometimes given as an adjunct to sulphate of quinia, in intermittents, where there is great want of gastric susceptibility. Highly valuable in malignant sore throat and scarlet fever, in which it is used both internally and as a gargle.

What are the forms of administration, and the dose of each?

Given in substance, infusion and tincture. Dose of the powder, 5 to 10 grains, in pill; of the infusion, made with ℥ ij. to Oss. of boiling water, f ℥ ss.; of the tincture, f ℥ j. to f ℥ ij. Gargle, prepared with ℥ ss. to Oj. of boiling water, or f ℥ ss. of the tincture, added to f ℥ viij. of rose-water; in malignant scarlatina, it is sometimes made much stronger, and with the additions of common salt and vinegar.

OIL OF TURPENTINE.—OLEUM TEREBINTHINÆ.

How, and from what is this prepared?

Oil of turpentine, or *spirit of turpentine*, as it is

commonly called, is prepared by distillation, from our common turpentine.

What are its physical and chemical properties?

It is limped and colorless, of a peculiar, penetrating, balsamic odor, and a hot, pungent, bitterish taste. It is much lighter than water, (sp. gr. 0.86;) very soluble in ether, less soluble in alcohol than most other volatile oils, and very sparingly soluble in water; highly volatile and inflammable. When pure, it consists of carbon and hydrogen, but as usually met with, it contains oxygen also, which is absorbed from the air, and changes a portion of the oil into a yellowish, resinous matter. This is soluble in alcohol, by which it is separated from the oil.

What are its medical properties, and therapeutical applications as a stimulant?

It is stimulant, diuretic, anthelmintic; in large doses, cathartic, and externally, rubefacient. As a stimulant, it is used in typhoid fevers, especially when connected with ulcerations of the mucous membranes; in chronic rheumatism, particularly sciatica and lumbago; in neuralgia; in passive hemorrhages from the mucous surfaces; in chronic dysentery, diarrhœa, &c.

What is the dose as a stimulant, and the best mode of administration?

Dose, from v. minims to f ʒ j.: given in emulsion with gum arabic, loaf sugar, and cinnamon or mint water

CARBONATE OF AMMONIA.—AMMONIÆ CARBONAS.

How is this salt prepared, and what are its physical and chemical properties?

It is prepared by subliming a mixture of muriate of ammonia and carbonate of lime; when a reciprocal action takes place, by which carbonate of ammonia, chloride of calcium and water are generated. The carbonate of ammonia and water sublime together as a hydrated carbonate of ammonia. It is in white, translucent, fibrous masses, of a pungent odor, and a caustic, alkaline taste. It is soluble in water and di-

luted alcohol, both of which decompose it when hot, with effervescence of carbonic acid. It consists of 3 eq. of carbonic acid, 2 of ammonia, and 2 of water: or, 1 eq. of bicarbonate, 1 of simple carbonate, with the same quantity of water, and is therefore a hydrated *sesquicarbonate*. It has an alkaline re-action, changing turmeric paper brown. Exposed to the air, it effloresces and soon falls to powder; carbonate of ammonia is evolved, and the remaining powder is the bicarbonate.

What are the signs of goodness?

It should affect turmeric paper, as above stated, when held over it, and should evaporate, without residue, when heated.

What are its medical properties and therapeutical applications, as a stimulant?

It is stimulant, diaphoretic, antispasmodic, antacid, and in large doses, emetic. As a stimulant, it is much used in the latter stages of typhus fever; in the advanced stages of pneumonia, with great prostration; in the cases of habitual drunkards, &c. Mixed with some aromatic oil, as oil of lavender or bergamot, it is much used under the name of *smelling salts*, as a nasal stimulant, in syncope and hysteria.

What is the dose, as a stimulant, and the best mode of administration?

Dose, 5 to 10 grains, every few hours; given in pill, or better in solution, with sugar and gum, to obtund its acrimony.

PHOSPHORUS.

What are the effects of phosphorus on the system?

In small doses, it is a powerful general stimulant; in large doses, an irritant poison. It is said to increase the secretions from the kidneys, and to excite the venereal passion. Rarely prescribed.

What is the dose and mode of administration?

Dose, gr. $\frac{1}{12}$; given in oleaginous or ethereal solution.

IV. NERVOUS STIMULANTS.

What are the peculiarities of this class of medicines, and the diseases to which they are applicable ?

They are stimulating medicines which, in addition to their action on the circulation, exert an excitant influence over the nerves at large, without any especial tendency to the brain. Applicable to all cases of nervous derangement, unconnected with inflammation or arterial excitement, and particularly to such as depend on, or are associated with, debility. More generally useful than any other class, in spasmodic affections ; and hence, usually denominated *antispasmodics*.

What are the substances belonging to this class ?

Musk, castor, assafetida, valerian, oil of amber, &c.

MUSK.—MOSCHUS.

What is musk, and its origin ?

It is an inspissated or concrete secretion, derived from the *Moschus moschiferus*, a wild animal inhabiting the mountainous regions of Central Asia, and resembling, in shape and size, the deer.

From what part of the animal is it obtained, and how is it prepared for market ?

It is contained in a small, oval, hairy sac, found only in the male, situated immediately in front of the preputial orifice. This is removed from the animal, and dried for exportation.

From whence is it imported, and what is the character of the sacs, as brought into market ?

There are two varieties: the *Chinese*, and *Russian* ; the former is brought from China, or Tonquin, by the way of Canton—the latter, which is a more inferior kind, comes from Siberia, through Russia. The musk pods are from two to three inches long, by one or two

broad; smooth and bare on one side, convex and covered with stiff, brownish-yellow hairs on the other; amidst which, there is a small, natural aperture. They are lined internally by a smooth membrane, the duplicatures of which form incomplete partitions. They usually contain from ʒj. to ʒiij. of musk, mixed with hairs.

What are the physical and chemical properties of musk?

It is in the form of small grains, unctuous to the touch; of a reddish-brown color; a strong, diffusive, very persistent odor, and of a bitter, aromatic taste. It is very complex in its composition. Water dissolves its active principles, partially; alcohol, more completely.

How is it usually adulterated, and the signs by which it may be detected?

Various substances are used to adulterate it; but the most common is dried blood, from its resemblance to musk. This, mixed with a portion of musk, is sometimes introduced into the sacs through an artificial opening, which is then carefully sewed up or glued together; and sacs are sometimes made of the scrotum and skin, and filled with the same mixture. The fraud may be detected by careful inspection, or by immersion in hot water, when glued together. The musk itself should possess the physical properties before detailed.

What are its medical properties and uses?

It is a stimulating antispasmodic; given in hysteria and chorea; in the subsultus tendinum and hiccough of typhoid diseases; in spasmodic affections of the stomach and bowels; in infantile convulsions, &c.

What is the dose and mode of administration?

Medium dose, 10 grains; given in pill or emulsion. Sometimes given to children in the form of enema.

How is *artificial musk* prepared?

By the slow addition of nitric acid to the unrectified oil of amber.

CASTOR.—CASTOREUM.

What is castor, and from what obtained ?

It is a peculiar concrete secretion ; obtained from two follicles situated between the anus and external genitals of both sexes of the *Castor fibre*, or *Beaver*.

What are its physical and medical properties ?

It is brought into market in pairs of membranous sacs, attached together by a kind of natural ligament. It is of a reddish-brown color, of a strong, peculiar, unpleasant odor, and of a nauseous, bitter taste. It is a moderate stimulant and antispasmodic ; occasionally given in hysteria, and other nervous affections.

How is it given and what is the dose ?

Given in bolus, emulsion or tincture. Dose, 10 to 20 grains ; of the tincture, f ʒ j. to f ʒ ij.

ASSAFETIDA—ASSAFŒTIDA.

What is assafetida, and the mode of preparing it for market ?

It is the inspissated juice of the *Ferula Assafoetida*, an herbaceous, umbelliferous plant, with a very large, fleshy, perennial root, growing in Persia. It is obtained by slicing off the top of the root, and the juice which exudes is scraped off, from time to time, and allowed to harden in the sun.

What are the routes by which it reaches our market ?

It comes either by the way of Great Britain, or is sent to India, and from thence imported.

What are its physical and chemical properties ?

It comes in irregular masses, packed in casks or cases ; of a softish consistence when fresh, becoming hard on exposure ; of a reddish-yellow color, externally, and presenting, when broken or cut, a whitish surface, variegated with pearl-white tears, which change rapidly to a red tint, when exposed to the air. It has a very fetid, alliaceous odor, and a bitter, acrid taste ; both of which are diminished by time and exposure, particularly the

odor. It softens by heat, without melting, and is inflammable. Its most important constituents are volatile oil, resin and gum, to the two former of which it owes its virtues. Water dissolves the gum; alcohol, the oil and resin, forming a clear tincture, which becomes milky on the addition of water.

What are its medical properties and therapeutical applications?

It is stimulant, antispasmodic, expectorant and laxative. A valuable remedy in nervous derangements, depending on debility. Much used as an antispasmodic, in hysteria, hypochondriasis, chorea, convulsions, hooping-cough, flatulent colic, &c.

What are the modes of administration and the doses?

It is given in pill, emulsion and tincture. Dose, from 5 to 20 grains; of the tincture, f ʒ j.

How is the officinal *mixture* (*Mistura Assafætida*), prepared, and what is its dose?

Prepared by rubbing ʒ ij. with Oss. of water until they are thoroughly mixed. This, which is frequently called *lac assafætida*, or *milk of assafetida*, is given in the dose of f ʒ ss. or f ʒ j. Often given as an enema, in the dose of from f ʒ ij. to f ʒ iv.

VALERIAN.—VALERIANA.

What is this officinally?

It is the root of the *Valeriana officinalis*, a large, herbaceous plant, indigenous in Europe.

What are the physical and chemical properties of the root?

It consists of numerous long, slender fibres, attached to a short, tuberous root-stock. Externally, they are of a yellowish-brown color; internally, whitish, and affords a yellowish-gray powder. Its odor is strong and characteristic, disagreeable to man, but pleasant to cats; its taste warm and bitter. Water and alcohol

extract its virtues, which depend on a volatile oil, and a peculiar volatile acid, called *valerianic acid*.

What are the sensible properties of the oil?

It is of a pale greenish color, of the odor of valerian, and of an aromatic taste.

What are the effects of valerian on the system, and its remedial applications?

It is a nervous excitant; given in hysteria, hypochondriasis, epilepsy, hemicrania, and in typhoid fevers, attended with restlessness, morbid vigilance, &c.

What are the forms of administration, and the dose of each?

Given in powder, infusion, tincture and oil. Dose of the powder, from ʒ ss. to ʒ iss.; of the infusion, made with ʒ ss. to Oj., f ʒ ij.; of the tincture, from f ʒ ij. to f ʒ iv.; of the oil, from 4 to 6 drops.

How is the *ammoniated tincture of valerian* prepared, and what are its advantages over the simple tincture?

Prepared by macerating valerian in aromatic ammoniated alcohol. The ammonia is thought to aid in the solution of the active principles of the valerian, and to contribute, by its own properties, to the efficacy of the preparation.

What is the dose and mode of exhibition?

Dose, f ʒ j. to f ʒ ij.; given in sweetened water.

AMBER.—SUCCINUM.

What is the source of amber?

It is a fossil resin, of vegetable origin, found in various parts of the world, but most abundantly on the shores of the Baltic, where it is thrown by the waters of the sea.

What are its properties and uses?

It is in small, irregular, brittle masses, breaking with a vitreous fracture, usually translucent and of a yellow color, tasteless and inodorous, except when rubbed or heated, when it exhales an aromatic odor.

It is insoluble in water, and nearly so in alcohol. Its most important constituents are a volatile oil and a volatile acid, called *succinic acid*. It is not now used in medicine; employed in the arts, and in pharmacy, to prepare succinic acid and oil of amber.

Oil of Amber.—*Oleum Succini*. How is this prepared, and what are its physical properties?

It is prepared by destructive distillation; and as thus procured, it is very impure, being dark, thick, and of a strong, empyreumatic odor.

How is it purified, and what are the properties of the officinal rectified oil? (*Oleum Succini Rectificatum*.)

It is purified by re-distillation with water. When perfectly pure, it is colorless, and as thin as alcohol; but as usually met with, it is of a yellowish-brown color, of a strong, unpleasant odor, and a hot, acrid taste. It is soluble in alcohol, and imparts its properties, in some degree, to water. On exposure, it becomes darker and thicker, and ultimately, black and solid. It is stimulant, antispasmodic, and, externally, rubefacient.

What are its therapeutical applications?

Given in spasmodic and convulsive affections. Applied externally, as a liniment, in chronic rheumatism and palsy; in whooping-cough, convulsions of children, &c.

What is the dose and mode of administration?

Dose, from 5 to 15 drops; given in emulsion.

SKUNK CABBAGE.—*DRACONTIUM*.

What is this officinally?

The root of the *Symplocarpus foetidus*.

What is the character of this plant, and place of growth?

It is an herbaceous, perennial plant, flowering in March and April, and sending up afterwards, from the root, numerous leaves, which, when fully grown, are

also as a rubefacient in the spasm of bowels in children—mixed with equal parts of honey and sweet oil

have a diuretic effect on the Kidney

very large and luxuriant. It is indigenous, growing abundantly, in meadows and swamps, throughout the Northern and Middle States.

What are the sensible properties of the roots, and how are they affected by heat and exposure?

The fresh root has a strong, fetid odor, and an acrid taste, which reside in a very volatile principle; and consequently, are dissipated by heat, and diminished by drying. It loses its properties by time, and should not be kept for use longer than a single season.

What are its medical properties and uses?

It is stimulant, antispasmodic and narcotic, and has been used in asthma, hysteria, chronic catarrh, &c.

What is the dose?

From 10 to 20 grains.

Mention some other substances which possess the properties of nervous stimulants.

Galbanum, *Sagapenum*, *Ammoniacum* and *Garlic*; these, however, are but little used as such, except garlic, which is frequently applied externally, to relieve spasm and allay nervous irritation. *Tea* and *Coffee* possess, together with tonic and astringent properties, those of nervous stimulants. *Electricity* and *Galvanism* are also powerful nervous excitants, and are sometimes resorted to in paralysis, nervous deafness, amaurosis, chronic rheumatism, and in many other nervous and chronic affections.

- garlic must be used in
the infantile epidemic and
rescued

V. CEREBRAL STIMULANTS.

What are the characteristics of these?

They are defined to be "medicines which, with a stimulating influence over the circulation and the general nervous system, conjoin a peculiar determination to the brain." Usually called *narcotics*, from the stupor they occasion in large doses; sometimes *anodynes*, from their influence in relieving pain; and *soporifics* or *hypnotics*, from their power to induce sleep. The individuals of the class, differ in many respects from each other; each one having its own peculiar mode of operation, and differing from the others, not only in the degree of its action, but in its particular tendency. They affect the brain more decidedly in large doses, whilst their excitant effects on the nerves and vascular system, are inversely proportionate, in degree and duration, to the quantity taken. In very large doses, they act as narcotic poisons, destroying the functions of the brain, when respiration ceases as a consequence. Supposed to act partly through the medium of the nerves, and partly by absorption. Their influence diminished in a remarkable degree, by repetition or habit, which makes it necessary, when their long continued use is required, that they should be given in gradually increased doses and frequently changed.

What are the individuals composing this class?

Alcohol, sulphuric ether, opium, lactucarium, henbane, hops, camphor, deadly nightshade, thorn-apple leaves and seeds, bittersweet, hemlock, &c.

ALCOHOL.

What is the origin and mode of preparing alcohol?

It is a product of the vinous fermentation; obtained from the vinous or fermented liquors, by distillation.

What is meant in commerce by *proof spirit*?

Those are called proof spirit which have a sp. gr. of 0.920, when they contain only from 50 to 55 per cent. of alcohol, mixed with water, essential oil, and other foreign matters.

How is *officinal* or *rectified alcohol* prepared, and what is its strength?

Prepared by re-distillation; sp. gr. 0.835; percentage of water, 15.

What is *Alcohol Dilutum*, or *proof spirit* of pharmacy?

It consists of equal measures of alcohol, or rectified alcohol, and distilled water; has a sp. gr. of 0.935, and contains 42 per cent. of absolute alcohol.

What are its pharmaceutical uses?

Alcohol, either in its rectified or diluted state, is much used for its solvent and preservative powers; employed in the preparation of the tinctures, spirits, ethers and resinous extracts; is added to the vinegars, to some medicated waters, infusions and decoctions, to assist in their preservation. *Diluted alcohol* mostly used in the formation of the tinctures, for which it is particularly adapted when the principles to be extracted are partly soluble in water and partly in alcohol.

What are its medical and poisonous properties?

Alcohol is the intoxicating principle of all spiritous and vinous liquors; in moderate doses, properly diluted, it acts as a powerful diffusible stimulant; in somewhat larger doses, it produces the well known effects of intoxication, and in excessive doses, it acts as a powerful narcotic poison.

What are its remedial applications?

Employed in the advanced stages of typhoid diseases; for this purpose brandy is usually selected, but wine is preferable to any of the distilled liquors, as its effects are more permanent and more easily regulated. Sometimes used also, in flatulent colic; in indigestion, vomiting, fainting, &c. Applied externally, to inflamed surfaces to produce cold by its evaporation, or to

stimulate when its evaporation is repressed ; occasionally used as an excitant injection for the radical cure of hydrocele.

Wines. What is the origin and composition of these ?

The fermented juice of the grape. All the varieties of wine contain, in different proportions, alcohol, water, mucilage, tannic and acetic acids, tartar, tartrate of lime, coloring matter and a peculiar principle, upon which the flavor and odor depend, called *bouquet*.

What wines are mostly used in medicine ?

Teneriffe, Sherry, Madeira, Port and Claret. As a stimulant, Teneriffe, Sherry or Madeira is generally selected ; Port wine, when a stimulant and astringent effect is indicated.

What is the proportion of alcohol in each of these ?

The two first contain between 19 and 20 per cent. by measure, of alcohol ; Madeira and Port, from 20 to 25 per cent., and Claret, from 12 to 17.

What is the objection to the *light wines*.

They are the least generous of all the wines, and are often acescent, which renders them liable to disagree with the delicate stomach, and improper in dyspeptic acidity, and in the gouty and uric acid diatheses.

What are the therapeutical applications of wine ?

An excellent stimulant in the advanced stages of typhoid fevers, especially when there is great prostration of the vital powers, attended with delirium, singultus, subsultus tendinum and sleeplessness, and in extensive ulceration and gangrene ; given either alone or combined with bark or opium. Given also, in convalescence from acute diseases, and in some convulsive affections, as tetanus.

What are the evidences of the favorable and unfavorable action of alcoholic liquors in febrile diseases ?

Signs of their good effects : an increased fulness, with diminished frequency of the pulse, and a mitigation of all the nervous symptoms ; of their unfavorable

action: a more frequent pulse, augmented heat and thirst, and an aggravation of the nervous symptoms.

What is the dose of wine, and mode of administering it?

Dose very variable; from a few ounces to a bottleful or more may be given in the course of 24 hours, according to circumstances; administered either pure or in the form of *wine- whey*. This is made by adding from a gill to half a pint of wine to a pint of boiling milk, straining without pressure to separate the curd, and sweetening with loaf sugar.

What are the peculiarities and medical uses of *malt liquors*?

They contain a smaller proportion of alcohol than wine, but a larger quantity of nutritive matter, and possess, in addition, a peculiar principle derived from the hop, which gives them a bitter taste and tonic powers. Occasionally used in debility, with enfeebled digestion; in local gangrene, sloughing, &c. Porter or ale usually preferred.

SULPHURIC ETHER.—ÆTHER SULPHURICUS.

How is this prepared and purified?

It is formed by the action of sulphuric acid, aided by heat, on alcohol, and separated by distillation. As thus procured, it is impure, and is mixed with an aqueous solution of potassa and re-distilled, when it is called *rectified sulphuric ether*.

What are its properties?

It is a transparent, colorless liquid, of a fragrant, penetrating odor, and a hot, pungent taste, followed by a sense of coolness. Its sp. gr. is about 0.750; it is extremely volatile, and produces, by its speedy evaporation, considerable coldness. It boils at 98° ; is highly inflammable, and consequently should not be handled near a flame. It becomes acid by keeping. It unites in all proportions with alcohol, and is dissolved by about ten times its weight of water. Its

ultimate constituents are hydrogen, carbon and oxygen.

What are its effects on the system, and its therapeutical applications?

It is a powerful diffusible stimulant, and its effects, which are rapidly produced, are equally transient. It is also antispasmodic and narcotic. Its vapor inhaled, produces a transient intoxication, resembling that caused by the protoxide of nitrogen, but very dangerous if carried too far. Used in spasmodic and nervous affections unaccompanied with inflammation, as cramp of the stomach and flatulent colic; in nervous headache, hysteria, and some stages of low forms of fever, attended with subsultus tendinum and hiccough. Mixed with a glass of white wine, it is said to be useful in cases of sea-sickness. The vapor inhaled from a piece of sugar held in the mouth, or disengaged by adding ether to warm water, has proved serviceable in spasmodic asthma and some other spasmodic affections of the respiratory organs. Sometimes applied externally, as a rubefacient or local stimulant, in rheumatic and neuralgic pains, its evaporation being repressed; and as a refrigerant, in strangulated hernia, its evaporation being allowed.

What is the dose and mode of administration?

Dose, from f ʒ ss. to f ʒ ij., often repeated, when its full effect is desired. Usually given in aromatic or sweetened water, with which it may be thoroughly incorporated by rubbing it up first with spermaceti, in the proportion of f ʒ j. to 2 grains, and separating the spermaceti by passing the mixture through a piece of muslin after the incorporation has been completed.

Compound Spirit of Sulphuric Ether. What is this commonly called, and how is it prepared?

Commonly known as *Hoffmann's Anodyne Liquor*. Prepared by mixing sulphuric ether and ethereal oil. (Proportions, Oj. to f ʒ ij.)

How is its transparency affected by water?

When properly prepared, it becomes milky when mixed with water, owing to the precipitation of the

oil ; this, however, does not prove its genuineness, as the same property may be given to it by the addition of various essential oils.

What are its medical properties and uses ?

Like ether, it is stimulant and antispasmodic, and possesses the additional property of an anodyne. Given in nervous irritation and wakefulness. Often prescribed in combination with laudanum, to prevent the nausea which sometimes follows the use of the latter.

What is the dose and mode of administration ?

Dose, from f ʒ ss. to f ʒ ij. ; given in a wine-glassful of sweetened water.

OPIUM.

What is opium ?

The concrete juice from the unripe capsules of *Papaver somniferum*.

What is the character of this plant, and where indigenous ?

It is an annual plant, with an erect, branched stem, from two to six feet high, with large, variously lobed leaves, and very large terminal flowers, which are generally white, with a purple eye. The capsules are of a rounded shape, from two to four inches in diameter, and contain numerous small, oily seeds, which are either white or blackish ; the ground of distinction between the *white* and *black poppy*. It is believed to be a native of Asia, but now grows wild in several other countries.

Where is it cultivated, and for what purposes ?

It is extensively cultivated in India, Persia, Egypt and Asiatic Turkey, for the sake of opium ; in Europe, chiefly for its capsules and the oil contained in the seeds, and in this country, as an ornamental flower.

What are the properties and uses of the mature capsules ?

As met with in the shops, they are of a globular shape, about as large as a common size apple, crown-

ed with the persistent, many-rayed stigma, of a dirty white color, and of a thin, fragile structure, somewhat like that of paper. They are without odor, and have a slightly bitter taste. They contain principles similar to those of opium, which they impart to boiling water. In medical virtues also, analogous to opium, but of very variable strength, and often exceedingly feeble. Sometimes employed in the form of decoction as an anodyne fomentation, to inflamed and painful parts.

What are the properties and uses of the oil obtained from the seed ?

The oil, which is obtained by expression, is a bland, yellowish fixed oil ; used in some places for culinary purposes, and in the arts, as a substitute for olive oil.

How is opium obtained, and what are the commercial varieties ?

Procured by making incisions into the capsules, through which a milky juice exudes ; this is scraped off, dried without heat, formed into cakes, and usually wrapped in poppy leaves, to prevent them from adhering. The varieties of opium are many, and called after the countries in which they are produced, or their places of export. Those mostly met with in our market, are *Turkey opium* and *Egyptian opium* ; the former is produced in the Turkish province of Anatolia and exported from Smyrna and Constantinople ; usually called after these ports, and considered by some as distinct varieties.

What are the physical properties of each of these varieties ?

Smyrna opium, the variety by far the most abundant in our market, comes in irregularly rounded or flattened lumps weighing usually from half a pound to a pound ; hard externally, or soon becomes so by being kept, and soft within. Each lump is covered externally with the reddish capsules of a species of *Rumex*, and sometimes with poppy leaves. It is of a reddish-brown color, and presents a waxy lustre when cut, and numerous small, shining tears when torn. Its

odor is strong and narcotic, and its taste bitter and acid.

Constantinople opium. The most of this differs but little, in quality and external appearance, from Smyrna opium, being equally irregular in shape, and covered with the capsules of the Rumex; but differs internally, being destitute of the tears which characterize that variety.

Egyptian opium is in flat, round cakes, from three to eight ounces in weight, wrapped up in a poppy leaf, the midrib of which divides the surface by an indentation. They are generally hard throughout, breaking with a conchoidal fracture and waxy lustre. It is of a redder color, usually, than Smyrna opium, but has a much weaker odor and about half the strength.

What are the physical properties of good opium?

When good, it is of a reddish-brown color, a peculiar, strong, narcotic odor, and a bitter, somewhat acrid taste, exciting irritation in the lips and tongue, when long chewed. When drawn over paper, it leaves an interrupted trace of a light brown color; becomes hard and brittle by exposure to the air; breaks with a uniform shining fracture; affords a yellowish-brown powder, and yields from 10 to 11 per cent. of morphia.

What are the signs of inferiority?

It is said to be of inferior quality, when of a blackish color, a soft viscid consistence, a dull fracture, and of feeble odor and taste; when it leaves a dark uniform trace on paper, forms a thick viscid solution with water, and yields but little morphia.

What are the effects of heat on opium, and its relations to water and alcohol?

It is rendered soft and adhesive by a slight heat, and is inflammable. Partially soluble in water and alcohol.

What is its chemical constitution?

It contains a great many principles; the following are peculiar to it: *morphia*, *narcotina*, *codeia*, *paramorphia*, *narcein*, *meconin*, and *meconic acid*; of

these the first is by far the most important, and is an officinal preparation.

Narcotina. How is this prepared, and what are its properties?

It may be obtained from opium or its aqueous extract, by means of sulphuric ether, which only dissolves the narcotina and yields it on evaporation. It crystalizes in white silky needles; is without taste or smell; fuses with a moderate heat; is nearly insoluble in water; very soluble in ether, and soluble in boiling alcohol and dilute acids; forming with some of the latter, compounds resembling salts, and hence it is ranked among the vegetable alkalies, though it has no alkaline re-action on vegetable colors. It was formerly believed, by some, to be the stimulating, by others, the narcotic, principle of opium, but it is now thought to be nearly devoid of these properties, and like quinia, is capable of arresting the paroxysms of remittent and intermittent fevers.

Codeia. What is the character of this principle?

It is a white crystalizable alkali, in medical virtues somewhat similar to morphia, and about half the strength.

What are the effects of opium on the system?

It is a stimulant narcotic. In medical doses, it excites the vascular system and exhilarates the nervous functions, which are soon followed by a sedative influence, attended with quiet and pleasurable sensations, and in the course of half an hour or so, by sleep. This usually continues six or eight hours, when the patient awakes, generally with more or less nausea, headache, tremors, loss of appetite, and a disinclination to active exertion; at the same time, it diminishes all of the secretions, except that from the skin, and lessens the peristaltic motion of the bowels. Such are the ordinary effects of opium; but it has been known to act very peculiarly on some persons, producing, even in very small doses, nausea and vomiting, restlessness, wakefulness, headache, and even delirium. Again,

some persons are comparatively insusceptible to its action, a state apt to be induced by habit, whilst others again, and especially young children, are extremely susceptible, one drop of laudanum having proved, in some instances, a dangerous dose for an infant a few weeks old. And lastly, its effects are greatly modified by disease and by combination. In excessive doses, it acts as a powerful narcotic poison, producing, soon after it is taken, giddiness, drowsiness, and in a short time, complete stupor, with scarcely any previous excitement. In such cases, respiration is slow and stertorous; the eyes closed and the pupils contracted; the muscles relaxed; the pulse at first full, slow and laboring, becomes more and more feeble, and death quickly ensues, unless prevented by active treatment.

What are its therapeutical applications?

It is capable of fulfilling numerous indications, and has a wide range of application. Its primary excitant action, renders it useful in typhoid diseases; its power to relieve pain, invaluable in many cases, and its effects in inducing sleep, important in all cases of morbid vigilance, unaccompanied with acute inflammation of the brain, as delirium tremens, &c., &c. Its influence in relaxing spasm, and allaying nervous, and in large doses, vascular irritation, makes it applicable to various diseases, as colic, spasm of the ureters, and gall-duct, from the passage of calculi; to cholera, cough, tetanus, hydrophobia, hysteria; to nervous irritation, from excessive losses of blood; to tenesmus, strangury, and to various other spasmodic, convulsive and painful affections. In suppressing morbid discharges, it is a valuable remedy in many cases, as in some stages of diarrhœa; in consumption, chronic catarrh, humoral asthma, diabetis, and in some forms of hemorrhage, combined with astringents. It is also valuable as a diaphoretic, when conjoined with small doses of emetic medicines, as with ipecacuanha, in the form of *Pulvis Ipecacuanhæ et Opii*.

What circumstances contra-indicate its use?

Contra-indicated by high inflammatory excitement, which should be first reduced by antiphlogistic measures, and the opium given in full doses, so as to secure its sedative effects. In such cases, often advantageously combined with antimonials, or ipecacuanha, which modify its excitant action and increase its tendency to the skin. Contra-indicated also, by inflammation of the brain, or strong determination of blood to the head, and whenever constipation of the bowels should be particularly avoided; constipation, however, sometimes relieved by it, when it depends on intestinal spasm, as in colic. Its constipating effects may be counteracted in most cases, by laxatives.

What is the proper treatment for its poisonous effects?

The stomach should be evacuated as soon as possible, either by means of emetics, or by the stomach-pump; the former to be preferred when solid opium has been taken, and their operation promoted by the free use of warm drinks, by irritating the fauces with a feather, by keeping the patient in motion, and by dashing cold water upon the head and shoulders. After its evacuation, the subsequent debility should be counteracted by stimulants, as carbonate of ammonia, aromatic spirit of ammonia, wine-whey, &c.; while sinapisms and stimulating frictions are applied to the surface. Artificial respiration as a dernier resort, should not be neglected.

What is the dose of opium, and how administered?

Medium dose, 1 grain; given usually in the form of pill, which is best prepared with powdered opium, as thus formed it is more readily dissolved in the liquors of the stomach. Sometimes applied with great advantage by the rectum, in painful affections of this and neighboring parts; and in cases of obstinate vomiting, employed as a suppository, 3 or 4 grains being made into a cylinder, with soap, and introduced into the rectum, or in the form of enema, made with laudanum and a small quantity of some bland liquid.

Tincture of Opium.—*Tinctura Opii.* By what other titles is this known?

Commonly called *Laudanum*, sometimes *Thebaic tincture*.

How is it prepared, and what are its advantages?

Prepared by macerating powdered opium, (℥ iiss.,) in diluted alcohol, (Oij.,) for 14 days, and filtering. It possesses the advantages over solid opium, of being more easily administered, especially to children, and acts more speedily.

What is the dose?

Dose of clear laudanum, equivalent to a grain of opium, about 13 minims, or 25 drops; but when long kept, and exposed occasionally to the air, it becomes thick, and much stronger, in consequence of the evaporation of a portion of the alcohol, and the deposition of opium.

How is it applied externally?

Often used as an addition to collyria, in ophthalmia; to injections in gonorrhœa, &c.; and to lotions, in various affections of the skin, as erythema and erysipelas; and in local pains, as those of gout and rheumatism.

Camphorated Tincture of Opium.—*Tinctura Opii Camphorata.* What is the familiar name of this preparation, and what are its constituents?

It is the well known *Paregoric Elixir*, consisting of opium, benzoic acid, oil of anise, extract of liquorice, clarified honey, camphor and diluted alcohol.

What are its therapeutical effects and applications?

It is a very pleasant anodyne, and antispasmodic; much used in pectoral affections, as cough, chronic catarrh, asthma, pertussis, &c.; to relieve nausea, and slight pains in the stomach and bowels, and to induce sleep, in cases of children.

What is its strength and dose?

Half fluidounce contains rather less than a grain of opium; ordinary dose for an adult, f ʒ j., or f ʒ ij.; for an infant, from 5 to 20 drops.

Acetated Tincture of Opium.—*Tinctura Opii Acetata*. How is this prepared, and for what is it intended as a substitute?

Prepared by macerating opium in vinegar and alcohol, for 2 weeks, and filtering. Introduced as a substitute for the old *Acetum Opii* or *Black Drop*.

What are its advantages?

It possesses the advantage over the *Black Drop*, of being of uniform strength, and is preferred by some, to laudanum, as being less apt to occasion the unpleasant, subsequent effects of the drug.

What is the dose?

Ten minims, or twenty drops, equivalent to a grain of opium.

Morphia. How is this prepared?

Opium is macerated in *distilled water*, by which a solution of morphia is obtained in the state of a meconate; to this solution, after being filtered, *alcohol* and *water of ammonia* are added, the ammonia displaces the morphia, which, in precipitating, is partially purified by the alcohol. To render it entirely pure, it is boiled in alcohol, till dissolved, filtered through animal charcoal while hot, and set aside to crystalize.

What are its physical properties and chemical relations?

It is in the form of small colorless crystals; is inodorous, and of a bitter taste. Exposed to a moderate heat, it loses its crystalline form, and becomes white and opaque. It is insoluble in cold water; slightly soluble in boiling water and cold alcohol, and readily so in boiling alcohol, which deposits it upon cooling; soluble also, in the fixed and volatile oils, and in solutions of potassa, soda and ammonia; insoluble in ether. It has an alkaline re-action, forming salts with acids, most of which are soluble. Morphia and its salts are characterized by striking a deep blue color with a solution of a persalt of iron, and by assuming a blood-red color, on the contact of nitric acid, changing ultimately to yellow. These tests, however, are

not infallible, especially the latter, as nitric acid produces a similar effect on *brucia*.

What are the medical properties of morphia?

It is thought to be the chief narcotic principle of opium, but on account of its insolubility in water, it is seldom prescribed in an uncombined state.

What are the preparations of morphia mostly used in this country?

The *Sulphate* and *Acetate*.

Sulphate of Morphia.—*Morphiæ Sulphas*. How is this prepared?

By mixing morphia in powder, with *distilled water*, and carefully adding *diluted sulphuric acid*, till the morphia is saturated and dissolved. The solution is then evaporated with a gentle heat, until crystals form upon cooling.

What is the character of the crystals, and their relation to water?

They are small, white and feathery; soluble in water.

Acetate of Morphia.—*Morphiæ Acetas*. What is the form and color of this salt, and its solubility in water?

As usually prepared, it is in the form of a white, crystalline powder, not entirely soluble in water, in consequence of the uncombined morphia which it contains; this, however, may be rendered soluble by the addition of a few drops of acetic acid.

What are the therapeutical effects of these salts, and their advantages over opium?

Like opium, they possess anodyne and soporific properties, but are less stimulant, less disposed to constipate the bowels, and are more exempt from the consecutive effects which sometimes render opium inconvenient, and often disagreeable. They are usually more acceptable to the irritated stomach, and are more efficient, when applied externally to the denuded dermis, in relieving violent neuralgic pains and obstinate sick stomach; and may be used in many cases which

do not admit of the internal use of opium, or its preparations.

What are their doses and modes of administration?

One-sixth of a grain considered equivalent to a grain of opium. Given in pill or solution. For endermic application, triple the ordinary dose.

Solution of Sulphate of Morphia.—*Liquor Morphiæ Sulphatis.* What is the advantage and dose of this preparation?

It affords a convenient form for administering sulphate of morphia in minute doses. Full dose for an adult, from f ʒ j. to f ʒ ij., which contain from $\frac{1}{8}$ to $\frac{1}{4}$ of a grain of the sulphate.

LACTUCARIUM.

What is this, and how collected?

Lactucarium is the inspissated juice of the *Lactuca sativa* or *garden lettuce*. Collected from the plant after the flower-stem shoots up, by cutting off the stem and collecting and drying the milky juice which exudes.

What are its properties and remedial uses?

In sensible properties, it bears considerable resemblance to opium, and is sometimes called *lettuce opium*, but in chemical constitution, it is very different, being destitute of morphia and most of the other principles of opium. In its operation on the system, it also resembles opium in some respects, but is much less, if at all stimulating, and produces none of those bad effects which usually follow the use of that medicine. It is, however, uncertain in its action. Employed to allay the irritation and cough of phthisis, &c.

What is the dose?

From 2 to 5 grains.

HENBANE.—HYOSCYAMUS.

What is this officinally?

The leaves and seeds of the *Hyoscyamus niger*, a

biennial, herbaceous plant, indigenous in Europe, and introduced into this country.

What are the physical and chemical properties of the leaves and seeds?

The leaves of the second year, which are the most efficient, have, when dried, a clammy feel, a fetid, narcotic odor, and a bitter, nauseous taste; in the fresh state, the odor and taste are much stronger. The seeds are small, irregular in shape, and of a brownish-yellow color. They have the odor of the plant, and a bitter taste. The leaves and seeds impart their virtues to water and alcohol. They contain an alkaline principle, closely resembling atropia, called *hyosciamia*, and to which some ascribe their virtues.

What are the effects of henbane on the system?

It is narcotic in its operation, differing however from many others of this class, in producing but little excitement in its primary operation, and exerting rather a laxative, than a binding influence over the bowels. In over doses, it acts as an acro-narcotic poison, producing pain and irritation in the bowels, with purging and delirium, followed by stupor, with dilatation of the pupils, and sometimes by death.

What are its therapeutical applications?

As an anodyne and hypnotic, it may be given with advantage in many cases; but being less efficient in these respects than opium and its preparations, it is generally resorted to, only instead of these, when circumstances forbid their use. An infusion of the leaves, or solution of the extract, is sometimes dropped into the eye, to dilate the pupil for the operation for cataract.

What are the forms of administration?

Given in substance, tincture and extract; most frequently in the latter form, which is officinal.

Extract of Henbane.—*Extractum Hyoscyami.* How is this prepared, and what are its physical properties?

Prepared by bruising the fresh leaves, sprinkled with

a little water, in a stone mortar, and then expressing the juice and evaporating to the proper consistence. As thus prepared, it is the inspissated juice, and is at first soft, becoming hard in three or four years; of a dark olive color, a narcotic odor, and a bitterish, nauseous taste.

What is the dose?

Dose of the powdered leaves, from 5 to 10 grains; of the tincture, f ʒj.; of the extract, 2 or 3 grains, gradually increased till some effect is produced.

HOPS.—HUMULUS.

What are these?

The strobiles of the *Humulus Lupulus*, a climbing plant, indigenous in Europe and North America.

How are the strobiles prepared for market, and what are their physical properties?

They are gathered in September, when ripe, dried by artificial heat, and packed in bales for market. They consist of numerous thin, papery scales, of a conical arrangement, are of a greenish-yellow color, a fragrant sub-narcotic odor, and a bitter, aromatic, slightly astringent taste. About the base of the scales is found, adhering, a fine golden yellow powder, which constitutes about one-sixth of the weight of dried hops, and may be separated by rubbing and sifting the strobiles. This is officinal in the U. S. P., under the name of *Lupulina*.

What are the active ingredients of hops, and their relations to water and alcohol?

Active ingredients, a volatile oil and a peculiar bitter principle, which exist more abundantly in the *lupulin*. Alcohol extracts these principles readily, boiling water the bitterness, with the dissipation of part of their aroma.

What are their medical properties and uses?

They are tonic, and slightly narcotic. Used in cases of debility, associated with nervous derangement.

A hop pillow sometimes employed to induce sleep. Hop fomentations and cataplasms often used in local pains and tumefactions; and an ointment of the powder, or lupulin, with lard, has been found to be a useful anodyne application to cancerous sores.

What are the forms of administration, and the dose of each?

Hops are given in infusion and tincture. Dose of the infusion, made with ℥ ss. to Oj. , f ℥ ij. ; of the tincture, from f ℥ j. to f ℥ iij.

How is lupulin given, and what is the dose?

Given in substance and tincture. Dose of the substance, 6 to 12 grains, administered in pill; of the tincture, from f ℥ j. to f ℥ ij.

CAMPHOR.—CAMPHORA.

What is Camphor, and from what derived?

It is a peculiar concrete substance, derived from the *Laurus Camphora*, a handsome evergreen tree, indigenous in China and Japan.

How is it procured and purified?

It is obtained from the chips of the roots and smaller branches, by sublimation. As thus obtained, it is impure, and is mixed with a small proportion of quicklime and sublimed a second time.

What are the physical and chemical properties of refined camphor?

It has the form of the vessel in which it was condensed, and is generally in hemispherical lumps, perforated in the centre. It is white, translucent, fragile, and yet not easily pulverized, unless with the aid of a little rectified spirit; of a shining fracture and a crystalline texture. It has an unctuous feel, a peculiar, strong fragrant odor, and a bitter, cooling taste. It is lighter than water, and is very volatile, being entirely dissipated when long exposed to the air; it melts and sublimates by heat, and is inflammable. Water dissolves a very minute proportion—sufficient, however, to im-

part to its odor and taste—but by means of magnesia, mucilage, sugar, or yolk of egg, a large quantity may be suspended in water. It is soluble in alcohol, ether, and the fixed and volatile oils. The camphor is precipitated from the alcoholic solution by the addition of water. Triturated with resins or fats it forms a soft, tenacious mass, with a diminution, and sometimes, extinction of its odor. In composition it is very analogous to the essential oils.

What are its effects on the system ?

In relation to its action, there is great difference of opinion ; generally believed to be excitant in its operation, and is thought, by some, to affect primarily and most prominently the brain and nervous system, and to favor diaphoresis. It also allays nervous irritation, and sometimes promotes sleep. In excessive doses, it occasions anxiety, vomiting, syncope, delirium, coma, &c., which effects are said to be best counteracted by opium.

What are its therapeutical applications ?

It is much used in the advanced stages of typhoid fevers, attended with subsultus tendinum, delirium and other nervous symptoms ; in spasmodic and nervous diseases, as dysmenorrhœa, puerperal convulsions ; some forms of mania, as that produced by the abuse of ardent spirit ; in atonic gout and chronic rheumatism, and in irritable and painful affections of the urinary organs, as strangury, especially when produced by cantharides.

What is the dose and best mode of administering camphor ?

Medium dose, 5 to 10 grains ; usually given in the form of pill, or made into an emulsion with water, by means of mucilage and sugar. The form of pill is said to be objectionable, as it is with difficulty dissolved in the gastric liquors, and floating on the top is apt to occasion nausea or uneasiness about the cardiac orifice of the stomach. In cases requiring only a slight impression, the officinal *camphor water*, *Aqua Camphoræ*, is a very convenient form.

How is this prepared, and what is its strength and dose?

Prepared by rubbing camphor, first with a little alcohol, then with magnesia, and lastly, with distilled water gradually added, and filtering through paper. As thus prepared, about 50 grains is contained in a pint, or rather more than 3 grains in a fluidounce. Dose, $\text{f} \frac{\text{ss}}{\text{j}}$. or $\text{f} \frac{\text{ss}}{\text{ij}}$. Camphor is also given in the form of tincture, the dose of which varies from 5 drops to $\text{f} \frac{\text{ss}}{\text{j}}$.

What are its external uses and modes of application?

It is often employed dissolved in spirit or oil, as in the form of the simple tincture; the *Camphorated Tincture of Soap*—*Tinctura Saponis Camphorata*; the *Camphorated Soap Liniment*—*Linimentum Saponis Camphoratum*, commonly called *opodeldoc*; and the *Camphor Liniment*—*Linimentum Camphoræ*; as an anodyne or stimulating embrocation, in rheumatic and neuralgic pains; in sprains, bruises, chilblains, glandular enlargements, &c.

DEADLY NIGHTSHADE.—BELLADONNA:

What is this officinally?

The leaves of the *Atropa Belladonna*, a perennial, herbaceous plant, indigenous in Europe.

What are the physical and chemical properties of the leaves?

They are ovate, acute, entire, of a dull greenish color when dried, a feeble narcotic odor, and a sub-acrid, slightly nauseous taste. Its virtues are extracted by water and alcohol, and are said to depend on an alkaline principle called *atropia*.

What are the effects of belladonna on the system?

In large doses, its effects are those of a powerful narcotic poison, such as dryness and constriction of the throat, thirst, ineffectual efforts to vomit, vertigo, delirium, usually of a mirthful character, comâ, with ex-

cessive dilation of the pupil, and sometimes convulsions, followed by death. In medicinal doses, its action is that of an anodyne and antispasmodic.

How are its poisonous effects best obviated?

The stomach should be speedily evacuated, either by stimulating emetics or the stomach-pump, and then the bowels, by active cathartics, while cold water is applied to the head; and if coma be present, ammonia should be given, and external stimulation employed.

What are its therapeutical applications?

It has been used in a number of spasmodic and nervous affections, as hooping-cough in the advanced stages, neuralgia, hysteria, chorea, epilepsy, hydrophobia, mania, paralysis, amaurosis, &c. It has been proposed and successfully used, it is said, as a prophylactic of scarlatina, in consequence of its having produced, in some instances, a rash on the skin, resembling that disease. Applied externally, to the eye or neighboring parts, to dilate the pupil before the operation for cataract; to the rectum and urethra, in spasmodic and neuralgic affections of these and contiguous parts, and to the neck of the uterus, to hasten labor when protracted from rigidity of the os tincæ.

How is it used and what is the dose?

It is given in substance, infusion, or extract; the latter mostly used. Dose of the powder, j. grain; of the infusion, made in the proportion of ℥j. to f ʒ x. of water, f ʒ j. to f ʒ ij. The extract, which is the inspissated juice, is of very variable strength, in consequence of which, it is best to begin with small doses, a quarter or half a grain, and repeat it 2 or 3 times a day, and gradually increase the quantity till some of its effects are experienced, as dryness of the mouth, stricture of the fauces, dilatation of the pupil, dimness of vision, giddiness or other unpleasant feelings in the head. To dilate the pupil, a strong infusion of the leaves or extract is dropped into the eye, or a little of the extract is rubbed upon the eyelids. When used

to facilitate labor, the extract is mixed with simple ointment, (℥ ij. to ℥ j.) and applied to the os uteri; and in spasmodic constrictions of the rectum and urethra, sometimes applied smeared over a catheter. Often applied in the form of plaster, in local neuralgic and rheumatic pains.

STRAMONIUM.

What is this officinally?

The leaves, *Stramonii Folia*, and the seeds, *Stramonii Semen*, of the *Datura Stramonium*, *Thorn-apple* or *Jamestown weed*.

What is the character of this plant, and where is it found?

It is an annual, herbaceous plant, from three to six feet high, found in various parts of the world, and growing in the U. States in rich soils about old settlements, and dung-heaps.

What are the physical and chemical properties of the leaves and seeds?

The leaves emit, when bruised, a strong narcotic odor, which they lose by drying. Their taste is bitter and nauseous. The seeds are small, kidney-shaped, of a dark-brown, almost black color; of a bitter, nauseous, somewhat acrid taste, and without odor, unless when bruised. They are said to contain, as also the leaves, in a less degree, an alkaline principle called *daturia*, to which their virtues are ascribed. These are imparted to water and alcohol.

What are the effects of stramonium on the system, and its remedial applications?

It is a powerful narcotic; producing, in excessive doses, poisonous effects nearly similar to those of belladonna. In medicinal doses, it resembles hyoscyamus in its action, and is given for the same purposes. It is frequently used in spasmodic asthma, during the paroxysm, by smoking the dried leaves or bruised root, in the same way as tobacco. In the form of an oint-

ment, (Unguentum Stramonii,) it is used as an anodyne application to irritable ulcers, painful hemorrhoids, &c.

What is the dose?

Dose of the powdered leaves, 2 or 3 grains; of the extract, or inspissated juice of the leaves, (Extractum Stramonii Foliorum,) 1 grain; of the seeds, gr. j.; of the extract prepared from the seeds, (Extractum Stramonii Seminis,) gr. $\frac{1}{4}$; of the tincture, ℥x. to ℥xx.; the dose of each to be gradually increased till some effect is produced.

BITTERSWEET.—DULCAMARA.

What is this?

The stems and twigs of the *Solanum Dulcamara*, or *woody nightshade*, a climbing shrub, indigenous in Europe and North America, growing in damp thickets and hedges.

What are the physical properties of the dried twigs as met with in the shops?

They are of various lengths, about the thickness of a goose-quill, consisting of a thin, wrinkled, grayish-ash colored bark, an interior light woody portion, and a central pith. They are inodorous, though of a faint nauseous smell when fresh. Their taste is at first bitter, afterwards sweetish; hence the name bittersweet.

What are its relations to water and alcohol?

They extract its active properties, which are supposed to depend partly upon a peculiar alkaline principle called *solania*.

What are its medical properties and uses?

It possesses feeble narcotic, diaphoretic and diuretic properties. Its principal use is in the treatment of cutaneous eruptions, as lepra, psoriasis, and pityriasis.

How is it given, and what is the dose?

Usually given in the form of the officinal decoction. Dose, f ʒ ij., 3 or 4 times a day.

HEMLOCK.—CONIUM.

What is officinal hemlock?

The leaves, *Conii Folia*, and seeds, *Conii Semen*, of the *Conium maculatum*, a biennial, umbelliferous plant, indigenous in Europe, and naturalized in this country.

What is the mode of collecting and preserving hemlock, and what are its physical properties?

The leaves should be collected in June or July, when the plant is in full flower, dried in the sun or with a very gentle artificial heat, and kept in well-stopped opaque bottles or jars, so as to exclude the air and light, by exposure to which, their medicinal virtues are impaired. The seeds, which are collected when fully ripe, are more active than the leaves, and retain their medicinal powers much longer. The fresh leaves, as well as the whole plant, exhale a fetid odor, compared to that of mice or the urine of cats, which is diminished by drying. Their color, when dried, is dark green, which is retained in the powder, and their taste nauseous and bitter. The seeds have less odor, and a bitter, somewhat acrid taste.

What are the relations of hemlock to water, alcohol and ether?

Its active principle, a peculiar, volatile, alkaline, oily substance, called *conia*, is partially extracted by water, and entirely so by alcohol and ether.

What are its medicinal actions and uses?

In relation to its action, there is great discordancy of opinion; some consider it narcotic, with no very marked excitant influence: while others ascribe to it the properties of an anodyne and direct sedative. It has been used in rheumatic and neuralgic affections, and in various pectoral diseases, as pertussis, asthma, chronic catarrh, and consumption, to alleviate pain and allay nervous excitement. Externally, it has been employed in the form of cataplasm or ointment,

as a palliative, in cancerous and painful ulcerations, and to tender glandular enlargements.

How is it administered and what is the dose?

Usually given in the form of powdered leaves and extract, or inspissated juice, (*Extractum Conii*.) Dose of the former, 3 or 4 grains; of the extract, 3 grains, repeated 2 or 3 times a day, and gradually increased till some effect is produced.

What are the evidences of its action on the system, and what are its poisonous effects?

The evidences of its full action are, vertigo, dimness of vision, nausea, faintness, and general muscular debility. Its poisonous effects are said to be very similar to asphyxia produced by any other cause, as slight convulsive tremors and twitches, general paralysis of the muscles, and consequent stoppage of breathing.

What caution is necessary to be observed in the use of different parcels of this medicine?

Its very variable strength renders it important, that when very large quantities have been given, the same parcel should be continued; or, if a different specimen be employed, the commencing doses should be small.

VI. ARTERIAL SEDATIVES.

What are sedatives ?

Sedative medicines are those which directly and primarily reduce the vital actions. Sometimes termed *contra-stimulants*, their action being the reverse of stimulants.

What is Professor Wood's division of sedatives ?

He divides them into *arterial* and *nervous* ; the former acting more especially on the circulatory system, reducing the action of the heart and arteries, in which way he conceives *Refrigerants* also to act, and hence considers them under the same head.

What conditions of the system indicate their use ?

They are called for in most cases of preternatural vascular excitement, as in fevers, especially those of an inflammatory character.

What substances are embraced in this class ?

Some of the preparations of antimony, as tartrate of antimony and potassa, the precipitated sulphuret, and the antimonial powder ; nitrate of potassa ; the vegetable acids, &c.

TARTRATE OF ANTIMONY AND POTASSA.—ANTIMONII ET POTASSÆ TARTRAS.

By what other name is this preparation called ?

Commonly called *Tartar Emetic*, sometimes *Tartarized antimony*.

How is it prepared ?

The following are the directions of the U. S. P. for its preparation : Take of *Sulphuret of Antimony*, in fine powder, ℥ iv. ; *Muriatic Acid*, ℥ xxv. ; *Nitric Acid*, ℥ ij. ; *Water*, a gallon. Mix the acids together in a glass vessel, add by degrees the sulph. ant. and digest the mixture with a gradually increasing heat, till effervescence ceases ; then boil for an hour. Filter the liquor after cooling, and pour it into the water.

Wash the powder which precipitates, with water, till it is entirely freed from acid, and then dry it. Take of this powder, ℥ ij.; *Bitartrate of Potassa*, in very fine powder, ℥ iiss.; *Distilled water*, f ℥ xvij. Boil the water in a glass vessel; then add the powders previously mixed together, and boil for an hour; lastly, filter the liquor while hot, and set it aside to crystalize.

What are its physical and chemical properties?

Tartar emetic crystalizes in transparent, colorless octohedrons, with a rhombic base. It is inodorous, but has a styptic, nauseous taste. As met with in the shops, it is usually in the form of powder, which when pure, is perfectly white. It is a double salt, consisting of two eq. of tartaric acid, one of potassa, one of sesquioxide of antimony, and two of water. By exposure to the air, the crystals lose their water of crystallization, and become white and opaque. It is soluble in 14 times its weight of cold water, and in less than twice its weight of boiling water; insoluble in alcohol. Its aqueous solution spoils by keeping.

What is the most common adulteration, and how may it be detected?

In the crystalline state, it is seldom adulterated, and in this form should always be preferred, it being one of the best evidences of its purity. The powder is frequently adulterated with cream of tartar, which may be detected by adding a few drops of a solution of carbonate of soda to a boiling solution of tartar emetic; a precipitate will be produced, which will be immediately re-dissolved, if cream of tartar be present.

With what substances is it chemically incompatible?

With most of the acids; the alkalies and their carbonates; some of the metals and their oxides; lime-water; chloride of calcium; the earths; the acetate and subacetate of lead; corrosive sublimate, and the decoctions and infusions of most of the bitter and astringent vegetables, as those of cinchona, rhubarb, galls, catechu, &c.

What are the therapeutical effects of tartar emetic?

Its general action is that of an arterial sedative, while it excites at the same time, most of the secretions. By varying the dose, and the circumstances under which it is given, it may be made to act variously, as an alterative, sedative, diaphoretic, diuretic, expectorant, purgative, or emetic. Applied to the skin, it produces a painful pustular eruption, and to the surface denuded of the cuticle, it acts as a caustic.

In what diseases and doses is it used as an alterative and sedative?

As an alterative, it is used in chronic cutaneous and chronic pulmonary affections, in the dose of gr. $\frac{1}{16}$, or gr. $\frac{1}{8}$, dissolved in a large proportion of water, and repeated, so that from gr. $\frac{1}{4}$ to gr. $\frac{1}{2}$ may be taken daily. As a sedative, it is employed in active hemorrhages, and in various febrile and inflammatory diseases, particularly those of the chest. Dose as a sedative, from gr. $\frac{1}{12}$ to gr. $\frac{1}{6}$; but in acute rheumatism, pneumonia, and pleuritis, it has been given in much larger doses, even in the enormous quantity of 10 or 20 grains, in divided doses during the day. By commencing with half grain doses, dissolved in a small quantity of water, and restricting the patient in the use of drinks, a tolerance of its action is said to be soon acquired, so that 1 or 2 grains may be given at a dose, every hour or two, without producing either vomiting or purging. This practice, however, is thought to be hazardous.

What are its external uses and modes of application?

It is used as a counter-irritant, in deep-seated pains; in whooping-cough; in chronic inflammation of the thoracic viscera, and other internal parts. Applied generally in the form of ointment, made in the proportion of 3j. or 3ij. to 3j. of lard, a small portion of which is rubbed on the sound skin 2 or 3 times a day till pustules appear, which usually occur in the course of a few days.

What conditions of the stomach contra-indicate its use?

Great irritation or inflammation of that viscus.

What are its poisonous effects, and how are they best treated?

Its poisonous effects bear considerable resemblance to malignant cholera; they are, an austere, metallic taste, nausea, vomiting and purging, burning pain in the bowels, cramp in the legs, great prostration, &c. After free vomiting, which should be encouraged, if necessary, by tickling the throat with a feather, and by the use of warm water, Peruvian bark should be given in large quantities, to decompose it; or if this cannot be had, a decoction of common tea may be substituted.

Antimonial Wine.—*Vinum Antimonii*. What is the proportion of tartar emetic in this preparation?

Each ounce of the wine contains two grains.

What wines are preferable in its formation?

Good Teneriffe or Sherry. The inferior wines contain principles which precipitate the tartar emetic.

What are the advantages of this preparation?

It affords the means of administering tartar emetic in minute doses, and has the advantage over the aqueous solution of keeping well.

Precipitated Sulphuret of Antimony.—*Antimonii Sulphuretum Præcipitatum*. How is this prepared?

By mixing *prepared sulphuret of antimony*, *solution of potassa*, and *distilled water*, and boiling them for three hours; constantly stirring and occasionally adding distilled water, so as to preserve the same measure; straining the liquor and dropping into it, while yet hot, *diluted sulphuric acid*, so long as it causes a precipitate. This is washed with hot water, to remove the sulphate of potassa, and the precipitated sulphuret is then dried and rubbed into a fine powder.

How is *Kermes mineral* and *golden sulphur of antimony* prepared?

The former is prepared by treating the sesquisulphuret of antimony with a boiling solution of the caustic or carbonated alkalis, which deposits a reddish-brown

powder—Kermes mineral—on cooling. The golden sulphur is formed by adding an acid to the mother liquor of the kermes.

How do these differ, chemically, from the precipitated sulphuret?

The latter is considered to be a mixture of sesquisulphuret, sesquioxide, and free sulphur; differing from the golden sulphur, merely, in containing less free sulphur. Kermes mineral, prepared with the caustic alkalies, is a hydrated sesquisulphuret of antimony.

What are the physical properties of the precipitated sulphuret?

It is a bright orange colored, insoluble powder, without odor, and of a slightly styptic taste.

What are its medical properties and uses?

It is diaphoretic or emetic, according to the dose. It is, however, an uncertain remedy. Sometimes given in combination with calomel and guaiac, in the form of *Plummer's pills*, as an alterative, in secondary syphilis and cutaneous eruptions.

What is the dose?

As an alterative, 1 or 2 grains; as an emetic, from 5 to 20 grains.

Antimonial Powder.—*Pulvis Antimonialis*. What is this an imitation of, and what is the Lond. formula for its preparation?

It is intended as a substitute for *James' powder*, a celebrated empirical preparation. Preparation: Take of *sesquisulphuret of antimony*, in powder, 1 part; *horn shaving*, 2 parts; mix and throw them into a red-hot crucible, and stir constantly until vapor ceases to arise. Rub the residue to powder; and in a proper crucible, expose it for two hours to a heat gradually increased to redness. Lastly, reduce to a fine powder.

What are its physical and chemical properties?

It is of a dull white color, without odor or taste, and is insoluble in water. It is said to consist of phosphate of lime, mixed with antimony, in an uncertain state of oxidation.

What are its therapeutical effects?

It is alterative, diaphoretic, purgative, or emetic, according to the dose. But these effects can be much more certainly and safely produced by tartar emetic, which is generally preferred to it.

What is the dose and mode of administration?

Dose, as a diaphoretic, from 3 to 8 grains; given in pill.

What are the saline refrigerants?

Most of the neutral salts possess, among other properties, those of a refrigerant or sedative; but the one which is considered most eminently sedative, is

NITRATE OF POTASSA.—POTASSÆ NITRAS.

What are the synonyma?

Nitre and Saltpetre.

What are the sources of nitre?

It is of both natural and artificial origin. In some of the United States, as Kentucky, Tennessee, Virginia, &c., it occurs naturally, for the most part in caverns, associated with nitrate of lime. In the East Indies, from whence commerce is chiefly supplied, it is found, in some districts, crystalized, on the surface of the soil, which is lixiviated and the lixivium evaporated till crystals form.

How are *artificial nitre-beds* made?

They are formed by mixing ashes and calcareous earth with vegetable and animal remains. These materials are placed in heaps under open sheds, so as to shelter them from the rain, and yet allow the free access of air, and are frequently stirred and sprinkled with urine, as a substance containing a large quantity of nitrogen, which, in the course of a few years, is converted into nitric acid, and this, by combining with the potassa in the vegetable remains, forms nitre.

In what state is nitre brought into market?

In an impure state, called in commerce, *crude saltpetre*, and requires to be purified for medicinal and most artificial purposes.

How is its purification effected?

It is purified from common salt, the most usual impurity, by taking advantage of the greater solubility of nitre in hot water.

What are the physical and chemical properties of the refined salt?

It is a colorless salt, crystalized generally in long, striated, semi-transparent, six-sided prisms, with dihedrals summits; is inodorous, but has a cooling, saline, slightly bitter taste. It dissolves in about four times its weight of cold, and half its weight of boiling water; insoluble in absolute alcohol. It is composed of 1 eq. of nitric acid, and 1 eq. of potassa, and though devoid of water of crystalization, the crystals are never free from water mechanically lodged within them. At a heat below redness it undergoes the igneous fusion, and if poured into moulds constitutes *sal prunelle*. It is decomposed by a red heat.

What are its medical properties and therapeutical application, as a refrigerant?

It is refrigerant, diuretic, diaphoretic, and in large doses, purgative. As a sedative refrigerant, it is used in active hemorrhages, particularly hæmoptysis, and in febrile and inflammatory affections, when the inflammation is not seated in the gastro-intestinal mucous membrane, the kidneys nor bladder. Combined with tartar emetic and calomel, in the form of *nitrous powder*, it is frequently given to promote the secretions of the liver and skin, and to reduce febrile excitement. Externally, it is employed as an ingredient in gargles in inflammatory sore throat, and in the form of *sal prunelle*, as an application to chapped lips.

For what salt is it sometimes taken, through mistake, and what are the consequences?

Sometimes taken, in half ounce or ounce doses, for sulphate of soda, (Glauber's salts,) when it produces violent pain in the stomach, vomiting and purging of blood, great prostration, &c.

How are its poisonous effects best treated?

By the use of mucilaginous and demulcent drinks; laudanum to allay pain and irritation, and cordials to support the system.

What is the dose and mode of administration?

Dose, from 5 to 15 grains; given in solution, and repeated every 3 or 4 hours.

What are the proportions of the constituents of the *nitrous powder*?

Eight or ten grains of nitre, the $\frac{1}{8}$ of a grain of tartar emetic, and a $\frac{1}{4}$ or $\frac{1}{2}$ a grain of calomel.

VEGETABLE ACIDS.

Which of these are mostly used as refrigerants?

The *citric* and *acetic*; the former generally preferred.

What fruits contain citric acid?

It exists in limes, lemons, sour oranges, tamarinds, &c.

In what form is this acid generally employed?

In the form of lemon-juice; though the citric acid, in solution, is sometimes substituted.

What are the most effectual modes of preserving lemon-juice?

One method consists in adding to the juice, expressed and strained, a tenth part of spirit of wine, filtering and preserving in well stopped bottles. Another is to allow the expressed juice to stand for a short time, till a coagulable matter separates, then filter and put it into glass bottles, with sufficient almond or other sweet oil to cover its surface.

What is the mode of preparing citric acid?

Carbonate of lime or chalk is added to lime or lemon-juice, which precipitates the citric acid in the form of citrate of lime. This is repeatedly washed with water, and decomposed by sulphuric acid. An insoluble sulphate of lime is formed, and the citric acid remains separated, in the supernatant liquor, which is concentrated with a gentle heat, and then

allowed to cool and crystalize. To obtain the crystals entirely pure, they require to be re-dissolved and re-crystalized for several times.

What is the color and shape of the crystals?

They are transparent, colorless, rhomboidal prisms, with dihedral summits.

How is a good substitute for lemon-juice prepared with citric acid?

By dissolving $\mathfrak{z}\text{j.}$ of the acid in Oj. of water, and flavoring the solution with a few drops of oil of lemons.

What are the proportions for forming lemonade?

One scruple of the acid to a pint of water, to which a little oil of lemons may be added, as before, and the solution sweetened with sugar, to the taste.

What is the most common adulteration of citric acid, and how detected?

Tartaric acid—This may be detected, in solution, by the addition of carbonate of potassa, which will form with it a crystalline precipitate of bitartrate of potassa, (cream of tartar.)

What are the medicinal uses of citric acid?

It is much used in the aforesaid forms, as a refrigerant drink, in febrile and inflammatory complaints; but one of its most important uses is in the prevention and cure of scurvy, for which it is almost a specific—

collected to stand. & decomposed. produced by adding sugar to it.

--some operate through nervous system. Others
through the circulation--

VII. NERVOUS SEDATIVES.

What are these defined to be?

"Medicines which, in their primary operation, reduce at the same time, the nervous power and the force of the circulation." They act directly on the nervous system, and are closely allied, in their effects, to narcotics, with which they are frequently confounded.

What are their general therapeutical applications?

They are applicable to cases of over excitement of the nervous and vascular systems.

What substances are comprised in this class?

Foxglove, tobacco, and hydrocyanic acid.

FOXGLOVE.—DIGITALIS.

What is this officinally?

The leaves of the *Digitalis purpurea*, a biennial, herbaceous plant, indigenous in Europe, and cultivated in this country.

Which are thought to be the most active, the wild or cultivated plants?

The wild; of which, those growing in sunny exposures are preferable.

What is the botanical character of the leaves?

They are large, ovate, lanceolate, obtusely serrated at their edges, with wrinkled, downy surfaces; the upper being of a deep green color, the under paler and more downy.

What is the mode of preparing them for market?

They are gathered in June and July, just before the plant comes into flower, and the leaf-stalk and mid-rib being removed, are then carefully dried, either in the sunshine or with a gentle stove heat.

What are the physical properties of the dried leaves?

When prepared as above and preserved in tin canisters, so as to exclude light and moisture, they are of a

—found in many varieties of flowers and
not the leaves are the most active
the middle of the leaf—

- should always begin with small doses -
its action last for a long time - will not
induce sleep -

dull green color, affording a fine deep green powder;
of a faint odor, and of a bitter, nauseous taste. Digitalis
is often met with in compressed masses, as prepared by the
Shakers, in which state it is frequently mouldy, and of inferior
quality.

What are its relations to water and alcohol?

It imparts its virtues to these menstua.

What are its therapeutical effects?

They are those of a narcotic, sedative and diuretic.

When its use has been continued for sometime, its sedative
action is manifested by the diminished force and frequency of the
pulse, which is reduced to 50, 40, or even 30 strokes in the minute.
In large doses, and even in small doses, too long continued, it acts
as a narcotico-acrid poison, producing giddiness, great debility,
with a slow, feeble and intermittent pulse, cold sweats, stupor,
and sometimes death, immediately preceded by coma and convulsions.

What peculiarity of digitalis renders great caution necessary
in its administration?

Its tendency to act with accumulated force; which makes it prudent,
that after it has been given for sometime, even without effect,
its use should be suspended for a short time; and this is particularly
necessary, after its constitutional effects are experienced.

How are its poisonous effects best counteracted?

By clearing the stomach of all the poison it may contain,
and by the subsequent employment of stimulants, both internally
and externally.

What are its practical applications as a sedative?

Applicable to cases of vascular excitement; but where much
inflammation is present, it can be relied on only as an adjuvant
to the lancet and other anti-phlogistic measures. Used, either
alone or conjoined with other agents, to repress the excited action
of the heart, in hypertrophy of that organ; in palpitations,
aneurism, phthisis, active hemorrhages, &c.

What are the forms of administration, and the dose of each?

Upon bleeding, its action is
is sometimes very
increased. In some cases -
it is sometimes increased -

- the action of digitalis is not
is due to its quantity
of the pulse - for some
the pulse is not
the action of digitalis is not
is due to its quantity
of the pulse - for some
the pulse is not

- this property more frequently for its diuretic
property

Given in substance, infusion and tincture; most effectual in substance. Dose of the powder, gr. j.; of the officinal *infusion*, made in the proportion of ʒj. to Oss. of boiling water, with f ʒj. of the tincture of cinnamon, f ʒ ss.; of the tincture, 10 drops; each to be repeated 2 or 3 times daily, and gradually increased, under the precautions before mentioned.

TOBACCO.—TABACUM.

What is officinal tobacco?

The leaves of the *Nicotiana Tabacum*, an annual plant, cultivated in various parts of the world.

What are the physical and chemical properties of the dried leaves?

They are of a yellowish-brown color, a strong, narcotic odor, and a bitter, nauseous, acrid taste. Their sensible and active properties are imparted to water and alcohol, but are destroyed by long boiling. Its most active constituent is a peculiar, liquid, colorless, volatile alkali, called *nicotia*, which has the odor of tobacco, and an acrid, burning taste, and is a virulent poison. It also consists of a concrete, volatile oil, called *nicotianin*—the chief odorous principle—and by destructive distillation affords an *empyreumatic* oil, of a dark-brown color, an acrid taste, and a peculiar odor, similar to that of tobacco pipes, which, when long used, contain this oil. It is a very active poison.

What are the therapeutical properties and applications of tobacco?

It possesses the properties of a sedative narcotic, an emetic, diuretic, sialagogue and errhine, and, under some circumstances, operates as a cathartic. In excessive doses, it acts as a narcotico-acrid poison, producing distressing nausea and retching, faintness, great prostration and vascular relaxation, a feeble, fluttering pulse, coldness, convulsions and death. It is chiefly used in the form of enema, to relax the muscular fibres: thus it is employed in strangulated hernia; in

obstinate constipation, from spasm of the bowels; in retention of urine, from spasmodic stricture of the urethra or neck of the bladder; in colic, tetanus, &c. Sometimes applied to the throat, in the form of a cataplasm or cerate, made with snuff, or smoked in the usual way, in spasmodic croup and asthma. It is also used externally, in the form of an ointment, in some chronic cutaneous diseases, as tinea capitis, &c.; its use is dangerous, however, and requires caution.

What is the proper treatment in cases of poisoning from it?

The poison should be immediately evacuated, either by emetics or enemata, according as it has been taken by the mouth or rectum, and internal and external stimulation assiduously practiced.

Why is more danger to be apprehended from its poisonous action, when taken by the rectum, than by the mouth?

Because it is more apt to be rejected in the latter case.

What is the strength of the officinal *infusion*, and the dose as an enema?

Made with ʒj. to Oj. of boiling water; half of which may be injected at once, and the remainder in course of half an hour, if necessary.

HYDROCYANIC ACID.—ACIDUM HYDROCYANICUM.

In what plants is this found?

Hydrocyanic or prussic acid exists in, or is formed, by the re-action of water upon *amygdalin*, a peculiar principle found in the *cherry laurel*, *wild cherry bark*, the kernels of *bitter almonds*, *peach*, &c.

How is it obtained from these plants?

By distillation with water, when it comes over along with a peculiar volatile oil.

What is the character of *cherry laurel water* as a remedy?

The proportion of hydrocyanic acid—its active in-

redient—is very variable, and consequently, it is an uncertain and unsafe preparation.

What is the advantage of the essential or volatile oil of bitter almonds, as a substitute for the medicinal hydrocyanic acid?

It is said to be less liable to decomposition; keeping for several years, in well stopped bottles.

In what state is hydrocyanic acid used in medicine?

In a diluted state, and never in a concentrated form.

How is officinal hydrocyanic acid prepared, and what is its strength?

It is obtained by distillation, from a mixture of *sulphuric acid*, *ferrocyanuret of potassium*, and *distilled water*; and to the acid product, sufficient distilled water is afterwards added to bring it to a proper state of dilution, when, according to the U. S. P., it contains 1.6 per cent. of the anhydrous acid. It is sometimes prepared for immediate use, by the action of *dilute muriatic acid* on *cyanuret of silver*. By the double decomposition that ensues, hydrocyanic acid and chloride of silver are formed; the former remains dissolved in the water, and the latter subsides. The clear liquor is then poured off for use.

What are the sensible properties of the medicinal acid?

It is a transparent, colorless liquid, with a taste at first cooling, afterwards warm and bitter, and an odor stated to resemble that of the oil of bitter almonds. *acid succinea*

What is the effect of exposure, and the best mode of keeping it?

It is decomposed by exposure to light, and should be preserved in well stopped opaque bottles.

What are its therapeutical properties and uses?

Prussic acid is the most powerful poison known, destroying life, sometimes, almost instantaneously. When not immediately fatal, the symptoms produced by it are, convulsions, difficult and spasmodic breathing, and insensibility, followed by death in a few minutes. In medicinal doses, it acts as a sedative,

and as such, has been used to allay irritation, relieve pain, and relax spasm. Thus, it has been employed in gastrodynia and enterodynia; in chronic vomiting, colica pictonum; and in various pulmonary affections, as hooping-cough, chronic catarrh, phthisis, spasmodic asthma, &c.

How are its poisonous effects most successfully combated?

If the person be seen immediately after the ingestion of the poison, he should be made to inhale chlorine or ammoniacal gas, diluted with atmospheric air, or a solution of either of these gases in water, should be administered in small, but frequently repeated doses; but if some time has elapsed, and insensibility be present, powerful external stimulants, with cold affusion and artificial respiration should be employed.

What is the dose and mode of administration?

Dose of the medicinal acid, 1 or 2 drops, every 2 or 3 hours, to be gradually increased, and its effects carefully watched. Best given in distilled water, to which simple syrup may be added. Dose of the oil of bitter almonds, $\frac{1}{4}$ of a drop to begin with; given in emulsion, with gum arabic, sugar and water.

What substance has been recommended as a good substitute for medicinal hydrocyanic acid, and why?

Cyanuret of Potassium, which is of uniform strength, and less liable to undergo decomposition, when carefully kept.

How is it prepared?

By exposing *ferrocyanuret of potassium*, which is a double cyanuret of potassium and iron, to a red heat, until nitrogen gas ceases to be disengaged; treating the calcined product, after cooling, with distilled water, and evaporating to dryness. The heat decomposes the cyanuret of iron, converting it into quadricarburet of iron, without affecting the cyanuret of potassium; this alone is dissolved by the water, and obtained upon evaporation.

What are its properties?

It is whitish, inodorous, when quite dry, and has an acrid alkaline somewhat bitter taste. On exposure, it deliquesces, absorbs carbonic acid, and is converted into carbonate of potassa with the evolution of hydrocyanic acid. It is insoluble in strong alcohol, very soluble in water, and is converted, by solution, into the *hydrocyanate* of potassa. This is decomposed by all the acids with the liberation of the hydrocyanic.

What is the dose, and best mode of administration?

Dose, $\frac{1}{4}$ of a grain, given in solution with some vegetable acid, as vinegar or lemon-juice, to set free the prussic acid.

Cyanuret of silver - eme-

VIII. EMETICS.

How may these be defined?

Substances which excite vomiting in certain doses as an ordinary result, and that, too, independent of the stimulus, of mere bulk, or of any nauseous taste or flavor.

What are the phenomena that usually attend their operation?

In the course of 10 or 20 minutes after an emetic has been taken, a disagreeable sensation termed *nausea*, is experienced, accompanied with symptoms of depression; as paleness, a cold and moist skin, a feeble, frequent pulse, and muscular relaxation. These symptoms increase till vomiting ensues, when they are followed by those of excited action; as a full, vigorous pulse, and a warm and florid skin, especially that of the neck and face: the symptoms, however, which mark these two distinct stages, vary much in intensity and duration, according to the nature of the emetic employed; thus the sulphates of zinc and copper, act very speedily without producing much nausea, while tartar emetic, tobacco and some others, operate more slowly, and produce great nausea and depression;

facts of great practical importance to be borne in mind in selecting an emetic.

What are the physiological agencies concerned in the production of vomiting?

The first impression of an emetic, is usually made upon the stomach, and through the medium of the cerebo-nervous system, the diaphragm and abdominal muscles are excited to action, and by their contraction, together with the contraction of the stomach, the contents of the latter are expelled. The necessity of cerebral influence, is evidenced by the difficulty of producing emesis when the energies of the brain have been weakened or suspended by profound intoxication or contusions of the head.

How do emetics differ in their *modus operandi*?

Some, as tartrate of antimony and potassa, are said to exert their influence indirectly upon the stomach, and to act *specifically*, that is, they excite vomiting, when applied to the skin, injected into the rectum or into the veins, as well as when taken into the stomach; while others, as mustard, act directly and *topically*, producing emesis only when swallowed.

What are the therapeutical indications that emetics are capable of fulfilling?

They may do good in diseases, 1. by evacuating the stomach; 2. by the sedation or muscular relaxation that accompanies their nauseating effects; 3. by promoting absorption or secretion; 4. by powerfully agitating the system or particular parts of it; and 5. by revulsion to the stomach.

What circumstances contra-indicate their use?

Acute inflammation of the stomach, bowels or neighboring parts; strong determination of blood to the brain; some organic diseases of the heart and arteries, as aneurism; pregnancy, in the advanced stages; and hernia and prolapsus uteri, require their avoidance or cautious employment.

How are emetics usually administered?

Diffused in water, and when the object is merely

to produce we see one of the highest medical operations

to evacuate the stomach, warm fluids, as warm water or chamomile tea, should be freely given, but these should not be allowed, however, where a poison has been taken, which acts only by solution, and in cases where it is desired to make a powerful impression on the system, with much nausea and retching.

How is excessive vomiting most effectually checked?

By the use of warm demulcent drinks; carbonic acid, as contained in soda water, or given off by soda powders, opiates, a spiced plaster or sinapism over the epigastrium, and if these should fail, by an enema composed of 60 drops of laudanum, with f ʒ ij. of a solution of starch.

1. *Vegetable Emetics.*

What are the principle vegetable emetics?

Ipecacuanha, gillenia and Indian tobacco.

IPECACUANHA.

What is this?

The root of the *Cephaelis Ipecacuanha*, a small shrubby plant growing in Brazil.

What are the physical properties of the root as imported?

It comes in pieces from 3 to 6 inches long, about the thickness of a goose quill, contorted, and presenting many circular depressions or grooves, which give it an annulated or ringed appearance. It consists of an exterior cortical portion, and a white ligneous centre. The former constitutes about $\frac{4}{5}$ of good ipecacuanha, is hard, semi-transparent, breaks with a resinous fracture, and possesses the active properties of the root in a much higher degree than the latter. The color of the external surface varies from browish, reddish-brown, reddish-gray to gray, and hence the distinction into *brown*, *red* and *gray* ipecacuanha, all of which, however, are said to have been derived from the same

plant, and to be essentially the same in chemical and medical properties. The cortical portion is easily pulverized, and affords a grayish, fawn colored powder, which has a faint nauseous odor, exciting violent sneezing in some persons, in others, dyspnœa and a bitter, acrid, nauseous taste.

What are its relations to water and alcohol?

They extract its virtues, which are injured by decoction.

What is its active ingredient?

A peculiar alkaline principle called *emetia*.

What are the incompatibles?

The salts of lead and of mercury, and astringent vegetable infusions.

What are the medical properties of ipecacuanha, and its therapeutical applications as an emetic?

In large doses, it is emetic, and sometimes cathartic, when the quantity is insufficient to vomit; in smaller doses, diaphoretic and expectorant; and in still smaller, stomachic. As an emetic, it is mild, but tolerably certain in its operation, and may be resorted to in all cases where the object is merely to evacuate the stomach, or a gentle impression only is desired. It is frequently associated with other more energetic emetics; as with sulphate of zinc and of copper, in narcotic poisoning, the action of which it renders safer by ensuring their discharge. As a nauseant, it is given in asthma, hooping-cough, hemorrhages, &c.

What is the dose and mode of administration?

Dose, as an emetic, 15 or 20 grains, suspended in water, and repeated at intervals of 20 or 30 minutes, if necessary; tepid drinks being taken the while to promote its action. Dose as a nauseant, 2 or 3 grains.

Wine of Ipecacuanha.—*Vinum Ipecacuanhæ*. For what purposes is this commonly used?

As an expectorant and diaphoretic. As an emetic, it may be advantageously substituted for antimonial wine, in infantile cases, when the antimonial is disposed to produce griping and irritation of the bowels.

In *Ipecacuanha* the root is round -
run entirely round -

EMETICS.

149

What is the dose?

As an emetic, for an adult, f ʒ j.; for an infant, f ʒ j.;
as a diaphoretic and expectorant, 10 to 30 minims.

GILLENIA.

- d. p. half the dose
if the wine -

What is officinal gillenia?

The root of the *Gillenia trifoliata*, though that of
the *G. stipulacea* possesses the same properties; two
indigenous, herbaceous, perennial plants, the former,
growing in the Eastern and the latter in the Western
States.

By what other names is it known?

- leaves are in threes
- comp. is small tree -

It is frequently called *Indian physic*; sometimes,
American ipecacuanha.

What are the physical properties of the dried root?

It is about the thickness of a small quill, wrinkled
longitudinally, with a few transverse fissures, and pre-
sented in the larger pieces, an undulated, somewhat
knotty appearance. It is of a light brown color exter-
nally, and consists of a thick brittle cortical portion,
with a slender, whitish, ligneous central cord, which is
comparatively inert, and should be rejected. The
powder is of a light, brownish color, a feeble odor,
and a bitter taste.

What are its relations to water and alcohol?

It imparts its virtues to these menstua.

What are its medical properties and uses?

It is a mild and efficient emetic, and like most other
emetics, acts occasionally upon the bowels. Some-
times used as a substitute for *ipecacuanha*, which it is
thought to resemble in its operation.

What is the dose?

From 20 to 30 grains, repeated like *ipecacuanha*,
till it vomits.

INDIAN TOBACCO.—LOBELIA.

What species of lobelia is principally used?

Lobelia inflata.

What is the character of this plant, and its place of growth?

It is an annual, herbaceous plant, with an erect angular, much branched, hairy stem, from 1 to 2 feet high, and with numerous pale-blue flowers, which appear from the latter part of July till frost. The fruit is an oval, striated, inflated capsule, containing in two cells numerous small brown seeds. It is indigenous in the United States; growing on the roadsides and in neglected fields.

What parts of the plant are used?

The whole herb is officinal, but the root and inflated capsule, are said to be most active; consequently, the plant should be collected in August or September, when the capsules are numerous.

What are the sensible properties of dried lobelia?

It has a faint but disagreeable odor, and an acrid taste when chewed, resembling that of tobacco. The powder is of a greenish color.

What are its relations to water and alcohol?

It yields its virtues to these solvents.

What are its medical properties?

It is emetic, and occasionally cathartic, and in small doses, diaphoretic and expectorant. It also possesses narcotic properties.

What is its character and chief use as an emetic?

It is a very powerful emetic, operating with much nausea, and general relaxation; and consequently, it is but little used except in cases of spasmodic asthma, in which it is often very useful.

What are its poisonous effects?

In large doses, it acts as a narcotico-acrid poison, producing effects nearly similar to those occasioned by tobacco. (See tobacco.)

How is it given, and what is the dose?

Given in powder, infusion and tincture. Dose of the powder, from 5 to 20 grains, as an emetic; repeated if necessary. The tincture is mostly employed, the full dose of which for an adult, is f ʒ ss.,

but in asthmatic cases, it is better administered in f ʒ j. or f ʒ ij.; dose repeated every 2 or 3 hours till it operates.

What other vegetable substances possess emetic properties, for which they have been employed?

The roots of the *Euphorbia Ipecacuanha* and *E. Corollata*, two indigenous plants, are emetic in the dose of 10 or 15 grains; but they are not more certain in their operation than ipecacuanha, and are much inferior to it in mildness, their operation being usually attended with considerable nausea, and followed by brisk purging.

Squill is emetic in the dose of 6 or 8 grains, but is seldom so employed.

Tobacco is a very powerful emetic in the dose of 5 or 6 grains, but the excessive nausea which it produces, and its narcotic properties, render it unfit for internal use.

Mustard, in the form of powder, and in the dose of a large tea-spoonful, sometimes acts as a stimulant emetic, and as such, is occasionally used in cases of great torpor of the stomach, resulting from narcotic poisons, &c.

The root of the *Sanguinaria Canadensis* or blood root, an indigenous plant, also possesses emetic properties.

What are the physical and chemical properties of the dried root?

It is in pieces from 1 to 3 inches long, and from $\frac{1}{4}$ to $\frac{1}{2}$ in thickness; flattened, much wrinkled and contorted, of a reddish-brown color externally, and of a bright orange internally; becoming of a dull brown by long exposure. It affords a brownish-red powder, which has a faint narcotic odor, and a bitter, very acrid taste. Its virtues are extracted by water and alcohol, and are ascribed to a peculiar alkaline principle, called *Sanguinarina*.

What is the character of blood root as an emetic?

It is an acrid, stimulant emetic; not much used: it also possesses narcotic powers. *with tendency towards brain*

What is the dose and mode of administration?

Dose of the powder, from 10 to 20 grains, given in pill, but the form of tincture is usually preferred. Dose, $f\ 3\ iij.$ or $f\ 3\ iv.$

2. Mineral Emetics.

What are the principal mineral emetics?

Tartar emetic, sulphate of zinc and sulphate of copper.

TARTAR EMETIC.

What characterizes this salt as an emetic?

Certainty, power and permanency of action. In the course of from 20 to 30 minutes after a full dose has been taken, vomiting usually ensues, which is frequently repeated and attended with much nausea, and general depression.

What are its therapeutical applications as an emetic?

It is applicable in cases where the object is to evacuate the duodenum as well as the stomach, and where a sedative, revulsive, or relaxing effect is also indicated. Much used in the commencement of febrile and inflammatory affections, in jaundice, hooping-cough and croup, in several nervous diseases, as mania, amaurosis, neuralgia, &c.; and its relaxing effects are sometimes taken advantage of in reducing old dislocations.

What is the dose and mode of administration?

Medium dose, as an emetic, from 2 to 3 grains; but the usual and better plan, is to give 1 grain, dissolved in a table-spoonful of water every 15 or 20 minutes, until it vomits, the operation being aided by warm water, or warm chamomile tea. Often combined with ipecacuanha, in the proportion of 1 grain of the tartrate, to 10 of ipecacuanha, and repeated as above.

What is the dose of *antimonial wine* as an emetic?

Dose, for a child under five years old, from 20 to 60 drops, repeated every 15 minutes, till it acts. Seldom given to adults as an emetic.

SULPHATE OF ZINC.

By what is this salt characterized as an emetic?

By its promptness and the little nausea it produces.

What is its chief use as an emetic?

Chiefly employed for the purpose of discharging poisons from the stomach.

What is the dose and mode of administration?

Dose, from 10 to 30 grains, dissolved in 3 or 4 ounces of tepid water, and the whole taken at once.

SULPHATE OF COPPER.

What is the character and chief use of sulphate of copper as an emetic?

It resembles sulphate of zinc in its action, but is more prompt and powerful. Used in cases of narcotic poisoning.

What is the dose?

From 2 to 3 grains, under ordinary circumstances; but in cases of insensibility of stomach from narcotic poisons, larger doses are required, from 5 to 15 grains.

What is the danger of giving very large doses of sulphate of copper and of zinc in such cases?

They are apt to act as irritant poisons if they do not speedily vomit, and thus produce an increase of mischief. Their administration rendered safer by combining them with ipecacuanha.

IX. CATHARTICS.

What are Cathartics ?

Medicines which produce alvine evacuations.

How do the individuals of this class differ in their operations?

Some act merely by exciting the muscular coat of the intestines to increased peristaltic motion, thus causing their contents to be more quickly and completely expelled. Some stimulate the mucous follicles and exhalants, rendering the evacuations more liquid and copious; while others extend their stimulus to the neighboring viscera, producing an increased flow of the supplementary intestinal secretions, as the bile and pancreatic juice. Cathartics, differ also, as to the part of the intestinal canal on which they act; the effects of some being chiefly confined to the small, of others, to the large intestines, while many appear to stimulate the entire tube. This difference thought to be owing partly to difference in solubility, but chiefly, to the peculiar susceptibilities of different portions of the bowels. They differ, moreover, in the degree of their action; and hence, the division into 1. *Laxatives*, which operate mildly, merely producing looseness; 2. *Purgatives*, which operate with more energy; and 3. *Drastics* or *Hydragogues*, which act with still greater power, producing, in over doses, inflammation of the bowels; characterized by vomiting and purging, with intense pain.

What are the therapeutical applications of cathartics?

They are useful as simple evacuants, in constipation, and various other affections, by removing offending matters, whether taken by the mouth, or generated in the system. They act as depletives, by increasing the action of the intestinal exhalants, and thus become beneficial as antiphlogistics in febrile and inflammato-

ry affections. In the same way, they diminish the amount of circulating fluid, and thereby promote absorption; thus proving useful in dropsies. By the gentle irritation which they occasion in the bowels, they are useful as revellents in various affections, and especially in those of the brain and nervous system.

They require to be cautiously administered in inflammations of the alimentary canal, in cases of extreme debility, and during menstruation and pregnancy.

What are some circumstances found to influence greatly the operation of cathartics?

By combination with each other, their operation is often greatly increased, and at the same time, rendered less irritating; as in the case of the *Compound Cathartic Pill*. Explained, by the fact, of their different tendencies and modes of operation. Their operation accelerated by combining them with small doses of emetic medicines and with bitters. Saline cathartics, rendered more active by copious dilution with water; as also, their solution, by impregnation with carbonic acid gas.

The operation of cathartics, has been promoted, also, by venesection, in diseases with plethora, and in some cases of obstinate constipation, and when this depends upon spasm of the bowels, even by combination with opiates. The griping tendency of cathartics, obviated or diminished, by the addition of aromatics, and the griping from senna and resinous cathartics, by combination with alkalies, or saline purgatives. Their nauseating effects lessened by aromatics also, and by carbonic acid water.

Their operation most speedy, when taken on an empty stomach, and is increased by exercise, as also, by mild diluent drinks, as molasses and water, barley-water, gruel, &c.

Their action retarded and diminished during sleep. Hence, when a prompt and energetic effect is desired, they should be given in the day time, on an empty

stomach; avoiding, if practicable, disturbing the quiet of the patient at night, by their operation.

How may hypercatharsis be checked?

By laudanum, administered either by the mouth or the rectum.

1. *Vegetable Cathartics.*

Recite the vegetable cathartics?

Manna, prunes, purging cassia, castor oil, rhubarb, senna, extract of butternut, aloes, jalap, may-apple, scammony, black hellebore, colocynth, gamboge, elaterium and croton oil.

MANNA.

What is manna?

The concrete juice of the ~~Fraxinus~~ ^{*Europæica*} *Ornus*, and other species of *Fraxinus*; small trees growing in the south of Europe, chiefly in Sicily, and the south of Italy.

How is the manna obtained?

The juice exudes spontaneously during the hot months, through fissures in the bark, but more abundantly through incisions made for the purpose, and concretes on the surface of the tree, or upon straw or chips, placed to receive it.

How many varieties of manna are there?

Three varieties; *flake manna*, *common manna* and *fat manna*.

To what are these varieties principally owing?

To the character of the season, and the mode, and time of collection.

What are its physical properties?

Flake manna, which is the purest, having been collected in the hottest and driest weather of summer, is in irregularly shaped pieces, resembling stalactites, frequently concave on the surface, by which they adhered to the tree; rough, porous, light and brittle, presenting,

when broken, a crystalline or granular structure; of a white or yellowish-white color, a faint odor, and a sweetish taste. *Common manna* or *manna in sorts*, which is collected in the fall, is not so completely concretioned, and is mixed with more impurities, from portions falling to the ground. It consists of small fragments, similar to flake manna, mixed with soft, viscid, brownish-yellow masses, which are identical with the *fat* or *fatty manna*, the most inferior variety, collected still later in the season, when the weather is cooler, and rains more frequent.

What are the chemical properties of manna?

Its most important and abundant ingredient, is a peculiar, saccharine principle, called *mannite*. This may be obtained separate, by boiling manna in alcohol, and pouring off the spirit, from which, as it cools, the mannite is deposited in the form of white crystals; of a sweetish taste, but differing from sugar, in not being susceptible of the vinous fermentation. Manna is soluble in water and alcohol. It softens with the heat of the hand, melts at a higher temperature, and is inflammable.

What are its medical properties and uses?

It is a gentle laxative; peculiarly adapted to children and pregnant women.

What is the dose and mode of administration?

Dose, for an adult, \mathfrak{z} j. or \mathfrak{z} ij.; for a child, from \mathfrak{z} j. to \mathfrak{z} iv. More frequently prescribed as an adjunct to other purgatives, as senna, rhubarb, magnesia, and the neutral salts.

PRUNES.—PRUNUM.

What are these?

The dried fruit of the *Prunus domestica* or *plum tree*.

What are their sensible and chemical properties?

They have a feeble odor, and a sweet, mucilaginous taste. They contain sugar, gum, and malic and pectic acids. Water extracts their virtues.

What are their medical properties and uses?

They are mildly laxative and nutritious. Stewed, they are used as a laxative article of diet, in cases of costiveness. Sometimes added to cathartic infusions and decoctions, to conceal their taste, and assist in their operation. The pulp enters into the confection of senna.

PURGING CASSIA.—CASSIA FISTULA.

What is this officinally?

The fruit of the *Cassia Fistula*, a large, handsome tree, growing in the East and West Indies.

What is the character of the fruit?

It consists of dark-brown, cylindrical pods, of a foot or more in length; straight or slightly curved, and less than an inch in diameter. They have an external woody shell, marked with three longitudinal bands, two of which are near each other, and the third, on the opposite side. Internally, they are divided by thin, transverse plates, into numerous cells, each of which, contains an oval, shining seed, imbedded in a soft, black pulp.

How is the pulp extracted from the pods, and what are its sensible properties?

Extracted from the dried pods, by bruising and boiling them in water, and evaporating the decoction; from the fresh pods, by a knife or spatula. The pulp is of a black, shining color, and has a slight odor, and a sweetish, mucilaginous taste.

What are its medical properties and uses?

In small doses, it is laxative; in large ones, purgative; but given as a purgative, it is apt to occasion nausea, flatulence and tormina. Sometimes given as a laxative, in habitual costiveness, and enters, as one of the laxative ingredients, into the confection of senna.

What is the dose?

As a gentle laxative, ʒj. or ʒij.; as a purgative, ʒj. or ʒij.

CASTOR OIL.—OLEUM RICINI.

From what is castor oil derived?

From the seeds of the *Ricinus communis* or *palm Christi*.

What is the character of this plant, and the places of growth?

In temperate latitudes, it is an annual, herbaceous plant, from 3 to 8 feet high; in warm climates, it attains the character of a tree, and the height of 30 or 40 feet. The flowers appear in July, and the seeds ripen successively in August and September. These are oval, somewhat compressed, about the size of a small bean, with a smooth, shining surface, of a pale gray color, marbled with reddish-brown spots and stripes. The seed has a small tubercle at one end, and bears considerable resemblance to the tick; whence the name *Ricinus*. They consist of a hard, brittle shell, enclosing a white, oily nucleus. The plant is a native of the East Indies and Northern Africa; has been naturalized in the West Indies, and is cultivated in various parts of the world; in the United States, most largely in Illinois.

How is the oil extracted from the seeds?

It is usually obtained by expression, either with, or without heat; that obtained without heat, is called *cold drawn* or *cold pressed castor oil*, and possesses the highest character. In the United States, the seeds are first subjected to a very gentle heat, to render the oil sufficiently liquid for easy expression, and then to compression in a powerful screw press. The oily liquid thus obtained, is boiled with a large quantity of water, and the impurities, as they rise upon the surface of the oil, is skimmed off; after which, the clear oil is removed, and carefully boiled a second time, with a small proportion of water, till aqueous vapor ceases to rise, the object of which is, to clarify the oil, and render it less irritating, by driving off the acrid volatile matter. In the East and West Indies, it is

frequently extracted by decoction, and the oil skimmed off as it rises to the surface.

What are the physical properties of the oil?

It is a thick, viscid liquid, colorless, or of a pale straw color, having a very faint odor, and a greasy, nauseous taste. It is lighter than water.

How may adulterations be detected?

The adulteration of castor oil with other fixed oils, a fraud rarely practiced in this country, may be detected by its complete solubility in absolute alcohol, and pure sulphuric ether, differing in this respect from all the fixed oils, except palm oil. It is also heavier than most of the other fixed oils.

What are its medical properties and uses?

When free from rancidity, it is a mild and efficient cathartic; particularly adapted to cases of constipation, and diseases attended with irritation or inflammation of the bowels; as colic, diarrhoea, dysentery and enteritis. Best cathartic in cases of pregnant and puerperal women, and for children.

What is the dose and best mode of exhibition?

Dose, for an adult, f ʒj.; for an infant, f ʒj. or f ʒij. Usually administered floating on the surface of some aromatic water, as that of mint or cinnamon. Sometimes more conveniently given, in a cup of sweetened coffee. Frequently made into an emulsion with the yolk of egg or mucilage, and some aromatic water.

RHUBARB.—RHEUM.

What is rhubarb?

The root of *Rheum palmatum*, and other species of *Rheum*, perennial, herbaceous plants, inhabiting Central Asia, and cultivated in Europe.

How is the root prepared for market?

It is dug up when the plant is about 5 or 6 years old, washed, scraped, and cut into various sized pieces to facilitate the drying; they are then pierced, strung

3. 11. 3. Rhubarb is a good cathartic and emetic.

upon cords and dried, some by the air, and some by artificial heat.

What are the varieties of rhubarb, their commercial histories and physical properties?

There are three chief varieties—*Russian*, *Chinese* and *European Rhubarb*.

Russian Rhubarb, sometimes called *Turkey Rhubarb*, is collected by the Bucharians, on the mountains of Tartary, and carried by them to the Russian frontier town, Kiachta, for bartar, when it undergoes a rigid inspection by an apothecary appointed by the Russian government for that purpose, and those pieces which are found to be sound and free from the attacks of worms, are sent on to St. Petersburg for exportation. This, which is the best and most costly variety, is met with in irregularly shaped pieces, somewhat angular, as if the cortical portion had been shaved off longitudinally with a knife. They are heavy, of a bright-yellow color, generally perforated with conical holes, extending, in some pieces, completely, in others, only partly through their substance, made evidently for the purpose of inspection. Internally, they are compact, beautifully marbled with red, yellow and white veins or points. It has a peculiar, somewhat aromatic odor, and a bitter, slightly astringent taste; feels gritty under the teeth when chewed, owing to the presence of crystals of oxalate of lime; stains the saliva yellow, and affords a bright yellow powder when pulverized.

Chinese or East India Rhubarb, is imported from Canton, and is the variety mostly used in this country. It is met with in round or flattened pieces, smooth on the surface, as if the cortical portion had been scraped off; of a brownish-yellow color; perforated with cylindrical holes, in many of which, are found pieces of cord, by which they were suspended while being dried. It is heavier, closer, and more compact than the Russian, and affords a yellowish powder, with a tinge of orange. Its odor and taste, are nearly similar to the Russian, and like it, is gritty when chewed, and stains the saliva

yellow. It sometimes contains mouldy and worm-eaten pieces, but when free from these, it is but little inferior to the Russian, and is much cheaper.

European Rhubarb, which is derived from the cultivated plant, occurs in irregularly cylindrical pieces, or in pieces resembling the Russian; the former, called in England, *stick rhubarb*, the latter, *trimmed rhubarb*. This is soft and spongy, and of difficult pulverization; affording a powder more deeply tinged with red than the Asiatic varieties. It has an astringent taste; scarcely feels gritty when chewed, and but slightly colors the saliva, on which accounts, it is sometimes preferred for chewing.

What are the chemical properties of rhubarb?

Its active ingredients are supposed to be, a peculiar principle, called *rhabarbarin* and *tannin*. Besides these, it contains several other principles; as gum, starch, oxalate of lime, &c. The European, contains most tannin, least rhabarbarin, and very little oxalate of lime. Water and alcohol extract its virtues.

What are its medical properties and uses?

It possesses the properties of a cathartic, astringent and tonic. In full doses, it operates as a mild purgative, stimulating the muscular coat of the whole intestinal canal, without augmenting materially its secretions, followed by its astringent effects. Its action sometimes accompanied with griping in the bowels. Used in dyspepsia with constipation, in chronic dysentery, diarrhoea and cholera infantum, when a purge is indicated; unsuitable in inflammatory diseases. Its astringent and griping tendencies counteracted, the first, by combining it with soap; the last, with aromatics. Roasting has the effects, it is said, of increasing its astringent and diminishing its purgative power.

What are the forms of administration, and the dose of each?

Usually given in powder, with molasses or syrup, or in pill; sometimes, in the form of one of the follow-

ing officinal preparations: *Infusion of Rhubarb*, *Tincture of Rhubarb*, *Tincture of Rhubarb and Aloes*, *Tincture of Rhubarb and Gentian*, *Tincture of Rhubarb and Senna*, commonly called *Warner's Gout Cordial*, *Syrup of Rhubarb*, *Syrup of Rhubarb and Senna*, and *Aromatic Syrup of Rhubarb*, commonly called *Spiced Rhubarb*. Dose of the powder, as a stomachic and laxative, from 5 to 10 grains; as a purgative, from 20 to 30 grains. The European, requires to be given in double this quantity. Average dose of the officinal forms, $\text{f } \frac{3}{4} \text{ j.}$ or $\text{f } \frac{3}{4} \text{ ij.}$, as a laxative; $\text{f } \frac{3}{4} \text{ j.}$, as a purgative.

SENNA.

What is senna?

The leaflets of *Cassia acutifolia*, *Cassia obovata* and *Cassia elongata*, small shrubs growing in the north of Africa and in Arabia.

What are the commercial varieties?

Three varieties brought to this country, *Alexandria*, *Tripoli* and *India Senna*.

1. *Alexandria Senna*. Where is this collected, and how is it prepared for market?

Collected in Upper Egypt. The shrubs, chiefly the *C. acutifolia*, are cut down, dried in the sun, and the leaves and pods afterwards stripped off, packed in bales, and sent to Boulac, the great entrepot of this variety. Here, it is mixed with the leaflets of the *C. obovata*, and adulterated with those of *argel*, and then transmitted to Alexandria for exportation.

How may the adulterating leaves be distinguished?

By their paler yellowish color; their greater length, being usually more than an inch long; their coriaceous texture, and by their being equal-sided; the leaflets of all the true sennas being unequal at their base.

2. *Tripoli Senna*. Where is this exported, and what are its distinguishing characters?

Exported from Tripoli. It consists, principally, of the *C. acutifolia*, much broken up. It seldom contains argel or cynanchum.

3. *India Senna*. From whence is this derived, and what are its distinguishing characters?

Imported from Calcutta, whither it is carried from Arabia. It is the product of the *C. elongata*, and may be readily distinguished by the greater length and comparative narrowness of the leaves.

How is commercial senna prepared for use?

By picking out the leaflets from the fragments, leafstalks and leaves of other plants.

What are the sensible and chemical properties of senna?

It is of a greenish color, and has a faint, sickly odor, and a viscid, nauseous taste. Water and alcohol extract its virtues, which are supposed to depend on a peculiar principle, called *cathartin*. The infusion deposits, on exposure to the air, a yellowish, insoluble precipitate, the nature of which is not well understood.

What is its character as a cathartic?

It is a prompt, efficient and safe cathartic; its operation attended sometimes, however, with considerable griping.

What are its therapeutical applications?

Applicable in febrile, and most other complaints requiring an effectual purgative. Often combined with the saline cathartics to obviate its griping tendency, and to increase, in febrile diseases, its antiphlogistic effects.

How is it given, and what is the dose?

Usually given in infusion. Dose of the officinal infusion, prepared with \mathfrak{z} j. of senna, \mathfrak{z} j. of bruised coriander seed, and Oj. of boiling water, from \mathfrak{f} \mathfrak{z} ij. to \mathfrak{f} \mathfrak{z} iv.

What are the medical properties and uses of the officinal *Tincture of Senna and Jalap*.

It is a purgative, possessing also cordial properties,

due to its aromatic constituents. Used in costiveness with flatulence; in atonic gout, &c.

What is the dose?

From $f\ 3\ ij.$ to $f\ 3\ j.$

What are the constituents of the *Confection of Senna*.

It is prepared with senna, coriander seed, liquorice root, figs, the pulp of prunes, tamarinds and purging cassia, refined sugar and water.

What are its medical properties and uses?

It is a very pleasant laxative, well adapted for cases of habitual costiveness, especially in pregnant women, and persons affected with the piles.

What is the dose?

From $3\ ij.$ to $3\ iv.$, taken at bed-time.

AMERICAN SENNA.—CASSIA MARILANDICA.

What is the character of the plant that yields American Senna, and its place of growth?

It is an herbaceous, perennial plant, from 3 to 6 feet high, bearing beautiful, golden-yellow flowers, which appear in July and August. It is found in all parts of the United States, south of New York, growing most abundantly in low, moist situations.

At what time should the leaves be collected?

In August, or the beginning of September.

What are their physical and chemical properties?

The leaves are sometimes found in the shops in the form of compressed cakes, as prepared by the Shakers; they are from $1\frac{1}{2}$ to 2 inches long, and from $\frac{1}{4}$ to $\frac{1}{2}$ an inch in breadth; of a pale green color, a feeble odor, and a nauseous taste, somewhat similar to that of senna. Water and alcohol extract their virtues, which depend on a principle analogous to the *cathartin* of senna.

What are its medical properties and uses?

They are similar to those of senna.

How is it administered, and what is the dose?

Given in infusion. Dose one-third larger than that of the imported senna.

EXTRACT OF BUTTERNUT.—EXTRACTUM JUGLANDIS.

From what is this obtained ?

From the inner bark of the root of the *Juglans cinerea*, an indigenous forest-tree, called by the several names of *butternut*, *oilnut*, and *white walnut*.

How is the extract prepared ?

By evaporating a decoction of the coarsely powdered inner bark of the root, or by the process of displacement.

What are its sensible properties ?

It is of a black color, a peculiar odor, and a bitter, astringent taste.

What are its medical properties and uses ?

It is cathartic, analogous in its action to rhubarb, and often useful in habitual constipation.

What is the dose ?

From 20 to 30 grains, as a purgative ; from 5 to 10, as a laxative.

ALOES.—ALOE.

What is aloes ?

The inspissated juice of the leaves of the *Aloe spicata*, and other species of Aloe, as *A. Socotrina*, *A. Vulgaris*, &c.

What is the character of these plants, and their places of growth ?

They have a round, erect stem, from 2 to 4 feet high, with numerous, large, fleshy leaves, and scarlet, bell-shaped flowers. They inhabit the south of Africa, Barbary, Socotra, and the East and West India Islands ; in some of the latter of which, as in Barbadoes and Jamaica, they are extensively cultivated.

What are the different modes of obtaining aloes, and the quality of the drug yielded by each ?

One method consists in cutting the leaves trans-

versely near their base, and inspissating the juice, which flows spontaneously from them, either in the sun or with a gentle artificial heat. This method affords the best aloes. The flow of juice from the leaves is sometimes promoted, by plunging them in hot water, and sometimes by pressure, when an inferior sort of aloes is obtained. A still more inferior kind is prepared by boiling the leaves and evaporating the decoction.

What are the commercial varieties?

Three varieties of aloes reach our markets, viz : *Cape Aloes*, *Socotrine Aloes*, and *Hepatic Aloes*.

1. *Cape Aloes*. What is the source and mode of preparing Cape aloes?

It is procured from the *A. spicata*, by the method first mentioned, and is of excellent qualities.

From whence is it imported?

Imported from the Cape of Good Hope into Great Britain, whence it is brought into the United States.

What are its physical properties?

Cape aloes, the variety mostly used in this country, has a shining, resinous appearance; is of a dark-brown color, with a greenish-yellow tinge in the small fragments, which are also semi-transparent. It is hard and brittle in cold weather, breaking with a smooth, glassy fracture, and affording, when pulverized, a greenish-yellow powder. It has a strong, disagreeable odor, much increased by breathing on it, and a very bitter taste.

2. *Socotrine Aloes*. Where, and from what plant is this prepared?

The genuine is prepared in the Island of Socotra, from the *A. Socotrina*. But the best specimens of other varieties, particularly those prepared in Spain and the West Indies, without expression and by inspissation in the sun, bear this name as a mark of superior quality.

What are its physical properties?

It is in pieces of a yellowish-brown color, becoming

darker by exposure to the air. Its surface is somewhat glossy, and its fracture smooth and glassy, with translucent, reddish edges. Its odor is fragrant, and its taste bitter, and somewhat aromatic. It yields a bright, golden-yellow powder.

3. *Hepatic Aloes*. From what places and plants is this derived?

It is derived from Spain and the West Indies, and a small quantity is brought from India. That derived from Spain and the West Indies, is the product of the

1. *Vulgaris*.

What are its physical properties?

It is in large masses, of a dull liver-brown color, whence the name; of a dull opaque fracture, a disagreeable odor, and a nauseous, intensely bitter taste. The powder is of a dull olive-yellow color.

What are the chemical properties of aloes?

Its most important constituent is a bitter extractive matter, called *aloesin*, which amounts to 75 or 80 per cent. in the best specimens. It contains also, a resinous substance, (*apotheme*,) and a trace of volatile oil, in the socotrine variety. It is rendered soft and tenacious by heat, and is inflammable. Cold water dissolves its active matter only, and forms a very permanent solution; boiling water dissolves it wholly, but deposits the resinous portion on cooling. Long boiling impairs its purgative properties, by converting the extractive into insoluble *apotheme*. Soluble also in alcohol.

Which is the best, and which the most inferior variety of aloes?

The socotrine is considered the best, and the hepatic the most inferior.

What is the character of aloes as a cathartic?

It is slow, but certain in its operation, acting especially on the large intestines, increasing their peristaltic motion, and producing feculent discharges. Frequently repeated, it is apt to irritate the rectum, and may produce hemorrhoids.

— It is probably by absorption both upon
the stomach and rectum — but latter for
the purgative effect —

How may its irritating effects be prevented?

By combining it with hyoscyamus; and in some degree, with soap, or an alkaline carbonate.

What are its remedial applications?

In small doses, it is very useful in habitual costiveness, especially when attended with torpor of the digestive organs; peculiarly useful in the treatment of ascarides, and is much employed in amenorrhœa.

What conditions of the system contra-indicate its use?

Hemorrhoids; irritation or inflammation of the large intestines, and pelvic viscera; pregnancy and menstruation.

What is the dose and best mode of administration?

Dose, as a laxative, from 2 to 6 grains; as a purgative, from 10 to 15 grains; given in the form of pill.

What is peculiar about its action, as connected with the dose?

When given beyond the medium dose, the increase of action is not in proportion to the increase of quantity.

What are some of the most important officinal preparations of aloes, in the solid form, and the dose of each?

Pills of Aloes and Assafetida; *Pills of Aloes and Myrrh*, sometimes called *Rufus's Pills*; *Compound Pills of Rhubarb*, and *Powder of Aloes and Canella*, commonly called *hiera picra*. The dose of each of these is from 10 to 20 grains.

What are some of the liquid preparations of aloes, and their doses?

Tincture of Aloes; dose, from f ʒ ss. to f ʒ iss. *Tincture of Aloes and Myrrh*, formerly called *elixir proprietatis*; dose, f ʒ j. or f ʒ ij., as a laxative and stomachic. *Wine of Aloes*; dose, f ʒ j. or f ʒ ij., as a laxative; as a cathartic, from f ʒ ss. to f ʒ j.

JALAP.—JALAPA.

What is this?

The root of the *Ipomœa Jalapa*, a climbing plant, with a tuberous root, growing in Mexico.

What are its physical properties?

It comes either in whole or half tubers, or in transverse circular slices. The entire tubers are ovoid; of a size usually smaller than the fist; generally incised more or less deeply, to facilitate their drying; wrinkled, and of a brown color externally. They are heavy, compact, hard and brittle, breaking with a shining, undulating fracture, of a grayish color, diversified with concentric, darker circles, and numerous brilliant, resinous points. The odor is nauseous, and the taste somewhat acrid and disagreeable. It is pulverized with difficulty, and affords a yellowish-gray powder.

What are its chemical properties?

It consists of resin, hard and soft; of gum, starch, lignin, &c. Alcohol dissolves the resin, its active ingredient; water only its non-cathartic components. The starch is often eaten by insects, and the relative strength of the root thereby greatly increased.

What are the adulterations and the evidences of such?

It is sometimes adulterated with *light* or *fusiform jalap*, called in Mexico, *male jalap*, and occasionally, also, with the *mechoacan*, or American bryony, as it is sometimes called in Europe. The presence of adulterations may be suspected, when the drug is light; of a whitish color internally; of a dull fracture, and of a spongy or friable texture.

What is the character of jalap, as a cathartic?

It is an active and brisk cathartic, producing copious watery stools, and occasionally, considerable griping in the bowels. In over doses, it produces hypercatharsis and inflammation of the alimentary mucous membrane.

What are its remedial applications?

It may be given in most cases, where an active cathartic is indicated. Much used, combined with calomel, in bilious fever; and with supertartrate of potassa, in dropsy, and in scrofulous affections of the joints, as coxalgia.

Union of tartar and jalap is a common combination, also jalap with calomel.

What is the dose?

From 15 to 30 grains; of jalap and supertartrate of potassa, 10 to 20 grains of the former, with 3 j. or 3 ij. of the latter; of calomel and jalap, 10 grains of each. Dose of the resin of jalap, 8 or 10 grains.

What are the disadvantages of this preparation?

It is apt to produce severe griping, and considerable irritation of the mucous membrane of the bowels; consequently, it is less eligible than the officinal *extract*—*Extractum Jalapæ*—which is prepared by means of both alcohol and water. Dose, 10 to 20 grains; but it is seldom given alone.

MAY-APPLE.—PODOPHYLLUM.

What is the character of this plant, and its place of growth?

The *Podophyllum peltatum*, *May-apple*, or *Mandrake*, is an indigenous, herbaceous plant, flowering about the end of May, or the beginning of June, and the fruit, a large oval berry, ripens in the latter part of September, when it is of a lemon-yellow color, has a peculiar, sweetish, sub-acid taste, and is sometimes eaten with impunity.

What is the officinal portion?

The root. The leaves are said to be poisonous?

What are the physical properties of the dried root?

It is in pieces of about two lines in diameter; thickly jointed; much wrinkled longitudinally, and of a reddish or yellowish-brown color externally; whitish within. The powder is yellowish-gray, resembling that of jalap. It has a ~~sweetish, sickly~~ ^{rather} odor, in the state of powder, and a taste, at first sweetish, afterwards bitter, acrid and nauseous.

What are its relations to water and alcohol?

It yields its virtues to alcohol and to boiling water.

What are its medical properties and uses?

It is an active hydragogue cathartic, resembling jalap in its operation, and may be employed in similar cases, forms and doses. *dose from xv to lx*

SCAMMONY.—SCAMMONIUM.

What is this ?

The concrete juice of the root of the *Convolvulus Scammonia*.

What is the character of this plant, and its place of growth ?

It has numerous, herbaceous, climbing stems, and a very thick, fusiform, fleshy root, which abounds in a milky juice. It is a native of Syria and the neighboring countries.

What is the mode of collecting and preparing the juice ?

The earth having been cleared away, the top of the root is sliced off obliquely, and the juice received in shells as it exudes ; afterwards mixed with that from other plants, and exposed to the air until it concretes. In this way the best scammony is prepared, but a more inferior kind is usually met with ; prepared by adding to the juice collected as above, that obtained from the leaves and stalks by expression, together with such impurities as wheat flour, chalk, ashes, fine sands, &c.

Whence is scammony exported, and what are the varieties ?

Exported from Aleppo and Smyrna, and was formerly called *Aleppo Scammony* and ~~*Smyrna Scammony*~~, after these places. The finest kind is called the *Virgin Scammony*.

What are its physical properties ?

The best, or *Virgin Scammony*, is in small amorphous masses, of an ash-gray color externally ; porous, friable, breaking with a conchoidal, resinous fracture, of a dark greenish color, and forming, when rubbed with the saliva, a greenish-yellow emulsion. Its odor is strong, resembling somewhat that of old cheese, and its taste, bitterish and acrid. But scammony, as usually met with in our shops, is more or less impure, and occurs in larger, darker, heavier, more com-

pact masses than virgin scammony, and is less brittle, and presents a duller, more earthy fracture.

What are the best chemical tests of its purity?

Chalk may be detected by the effervescence produced when muriatic acid is dropped on a small fragment, and flour by a cooled and filtered decoction of the powder, being rendered blue by tincture of iodine.

What are its chemical properties?

It is a gum-resin. Its chief constituent is resin, which constitutes more than two-thirds of the weight of good scammony. It is partially dissolved by water, more largely by alcohol, and completely, with the exception of impurities, by diluted alcohol.

What is its character as a cathartic?

It is a drastic cathartic, operating sometimes with considerable harshness.

What are its therapeutical applications?

It is applicable in cases of habitual constipation, arising from a torpid state of the bowels. It is usually given in combination with other cathartics, the action of which it promotes, while its own harshness is diminished. In the form of the *Compound Extract of Colocynth*, and the *Compound Cathartic Pill*, it is often beneficially employed in the commencement of bilious fevers, and other complaints, attended with congestion of the liver and portal circle.

What is the dose and best mode of administration?

Dose, from 5 to 10 grains, made into an emulsion with milk.

BLACK HELLEBORE.—HELLEBORUS NIGER.

What is the character of this plant, and its place of growth?

It is an herbaceous plant with a perennial root, consisting of numerous, long, simple fibres or radicles, proceeding from a knotty head. Its flowers, which are large and rose-like, expand in the middle of winter, and hence the name *Christmas Rose*, by which the

plant is sometimes called. It is a native of the middle and southern parts of Europe.

What is the part used in medicine?

The whole root is officinal, but the fibres are chiefly used.

What are the physical and chemical properties of the dried root?

The root-stock is black, and the fibres brownish-black externally, whitish within. They are about the thickness of a straw, brittle, have a faint odor and a bitterish, nauseous, acrid taste; its acrimony having been much diminished by drying. Water and alcohol extract its virtues, which are impaired by long boiling.

What are its medical properties, and therapeutical applications as a cathartic?

It is a drastic, hydragogue cathartic, possessing also emmenagogue properties. In over doses, it produces inflammation of the gastro-intestinal mucous membrane, with vomiting, hypercatharsis, vertigo, cramps, and convulsions, ending sometimes in death. As a cathartic, it is not much used at present. It was highly prized by the ancients, as a purgative, in cerebral and nervous affections, and in dropsy. It was the chief ingredient of *Bacher's Pills*—celebrated for the cure of dropsy.

How is it given, and what is the dose?

Given in powder, decoction, tincture, or extract. Dose of the powder, from 10 to 20 grains; of the decoction, made with ʒ ij. to Oj., f ʒ j., every 4 hours till it acts; of the tincture, f ʒ j.; of the extract, 12 or 15 grains.

COLOCYNTH.—COLOCYNTHIS.

What is colocynth officinally?

The fruit of the *Cucumis Colocynthis* or bitter cucumber, deprived of its rind.

What is the character of the plant, and its place of growth?

It is an annual herbaceous plant, with trailing stems, much resembling our common garden cucumber. It is a native of Turkey, the islands of the Archipelago, &c.

What is the character of the fruit, and the mode of preparing it for market?

It is a globular berry, about the size of a small orange, of a yellow color when ripe, and contains within a coriaceous rind, numerous white seeds, imbedded in a soft pulp. It is gathered in autumn when it begins to yellow, peeled and dried quickly, either in the sun, or in a stove.

What are the physical properties of the fruit, as found in the shops?

It is in whitish balls, very light and spongy, and of difficult pulverization. It has a feeble odor, and a nauseous, intensely bitter taste. The seeds constitute about three-fourths of their weight, and are entirely inert, and should be rejected.

What are its chemical properties?

Its active ingredient, is a peculiar, bitter principle, called *colocynthin*, which is extracted by water and alcohol.

What is its character as a cathartic?

It is a powerful, drastic hydragogue cathartic, operating harshly when given alone, and is therefore usually combined with other purgatives to mitigate its harshness.

What is the preparation mostly used?

The *Compound Extract*.—(*Extractum Colocynthis Compositum*.)

What is the composition of this preparation, and its character as a cathartic? *unctione fruit made and*

It is composed of *colocynth*, *aloes*, *scammony*, *cardamon* and *castile soap*. It is a very active and safe cathartic. *than other*

What are its remedial applications?

It is much used in obstinate constipation; in the

commencement of fevers; and combined with calomel, in congestion of the liver and portal system.

What is the dose of the pulp of colocynth, and of the compound extract?

Dose of the pulp, from 5 to 10 grains; of the compound extract, from 10 to 15 grains.

GAMBOGE.—GAMBOGIA.

What is this?

The concrete juice of an unascertained tree, inhabiting Siam, probably of the *Stalagmitis Cambogioides* and *Hebradendron Cambogioides*.

How is it prepared, and from what places is it imported?

Procured by breaking off the leaves and young shoots, from which the juice issues in drops, and is either received into the hollow joints of the bamboo, which gives it a cylindrical form, or into some suitable vessel, and allowed to stand until it attains the requisite thickness, when it is usually rolled into cylinders, and wrapped in leaves. Imported from Canton and Calcutta.

What are its physical properties?

It is generally met with in cylindrical rolls, from one to two inches in diameter, sometimes hollow in the centre; often folded double and agglutinated together, striated externally, and of a reddish-yellow color, with greenish stains, and usually dusty with the bright yellow powder of the drug. It is brittle, breaking with a shining, conchoidal fracture. This is sometimes called *pipe gamboge*. A more inferior kind is sometimes met with, under the name of *cake* or *lump gamboge*, in irregular masses, weighing from two to three pounds, often mixed with sticks and other impurities. Gamboge has no odor, but a slightly acrid taste.

What are its chemical properties?

It is a gum-resin; its medicinal virtues residing in the resin. It is insoluble in water, but forms with it a

perfect emulsion. Alcohol dissolves it, almost entirely. Like all the gum-resins, it softens by heat, without melting, and is inflammable, burning with much smoke.

What are its medical properties and uses?

It is a powerful, drastic, hydragogue cathartic, with an aptitude to produce nausea and vomiting, in full doses; and inflammation of the mucous membrane of the stomach and bowels, in over doses. Sometimes given in dropsies and encephalic affections, in small doses; but usually combined with other and milder cathartics, to temper its action.

What is the dose and best mode of administration?

Dose, 2 or 3 grains, repeated every 3 or 4 hours, till it operates. Given in pill or emulsion.

Compound Cathartic Pills.—*Pilulæ Catharticæ Compositæ.* What are the constituents of this preparation?

It consists of *compound extract of colocynth, extract of jalap, calomel and gamboge.*

What are the advantages of this form?

It combines smallness of bulk, with efficiency and comparative mildness of action, and a peculiar tendency to the liver. Smallness of bulk obtained by using extracts, and the more energetic cathartics; a tendency to the liver imparted by the calomel; and greater efficiency, with mildness, the result of the union. This before explained, (page 155.)

What are their remedial applications?

They may be employed in all cases requiring an active cathartic; particularly applicable to the early stages of bilious fevers, hepatitis, jaundice, &c.

What is the dose?

Three pills, which contain 4 grains of comp. ext. of colocynth, 3 of extract of jalap, 3 of calomel, and $\frac{2}{3}$ of a grain of gamboge, making $10\frac{2}{3}$ grains of the mass.

ELATERIUM.

What is elaterium?

A substance deposited from the juice of the *Momordica Elaterium*, wild or *squirting cucumber*.

What is the character of this plant, and its place of growth and culture?

It is an annual, trailing plant, with a thick, rough, branching stem. The fruit, (*pepo*,) is about an inch thick, and an inch and a half long, greenish, and covered with prickles; when ripe, it falls off, and throws out its juice and seeds with considerable force, through the place of its attachment to the foot-stalk; from which circumstance, it is thought, it derived its name. It is a native of the south of Europe, and is cultivated in Great Britain.

What are the modes of obtaining elaterium, and the one that yields the best?

It is mostly prepared as follows: the ripe fruit is sliced, and the juice gently expressed through a fine hair-sieve, and allowed to stand until the thicker part has subsided; the thinner, supernatant part, is then poured off, and the thicker, dried with a gentle heat. Dr. Clutterbuck's method, which yields the genuine elaterium, differs from the above, in allowing the juice to flow out without expression. A very inferior kind is sometimes prepared by expressing and evaporating the juice.

What are its physical properties?

It is in thin, flat cakes or fragments; light and friable; of a greenish-gray color, and generally bearing the impression of the muslin upon which it was dried. It has a very faint odor, but a bitter, acrid taste.

What is its active ingredient?

A peculiar crystalizable principle, called *elaterin*.

What are its medical properties and uses?

It is a powerful, hydragogue cathartic, and generally excites, in full doses, nausea, and frequently vomiting; and in over doses, inflammation of the stomach and bowels. It also possesses diuretic properties. It has proved to be a very efficient remedy in dropsy.

What is the dose?

Of the purest, gr. $\frac{1}{8}$; of the common, gr. $\frac{1}{2}$; every hour till it operates. Dose of elaterin, from $\frac{1}{16}$ to $\frac{1}{12}$ of a grain.

CROTON OIL.—OLEUM TIGLII.

From what is this derived?

From the seeds of the *Croton Tiglium*, a small tree, growing in India, the Molucca Islands and Ceylon.

What were the seeds formerly called?

Grana Tiglia, *Grana Molucca*, &c.

What are their physical and medical properties?

They are rather larger than a grain of coffee, and of an irregular, quadrangular shape. They consist of a soft, yellowish-brown epidermis, a blackish shell, and a yellowish-brown, oily kernel. In the dose of one or two grains, the kernel purges actively.

How is the oil extracted from the seeds?

By expression; the seeds having been previously roasted, and deprived of their shells.

What are the sensible properties of the oil?

As found in the shops, it is of an orange color, with a faint but peculiar odor, and a very acrid taste.

What is its chemical constitution?

It consists of a peculiar acid, named *crotonic acid*, dissolved in a bland, fixed oil, to the former of which, it owes its active properties.

What is the most common adulteration, and how may it be detected?

Castor oil is the most common adulteration, and may readily be detected, by its solubility in alcohol, whilst croton oil is insoluble.

What is its character as a cathartic?

It is a powerful, hydragogue cathartic, operating usually, in small doses, with ease to the patient; but in large doses, it is apt to occasion vomiting and severe griping, and in over doses, may prove fatal.

What are its therapeutical applications as a cathartic?

It is used in obstinate constipation; in dropsy; in comatose affections, and in various convulsive and neuralgic diseases.

What is the dose and best mode of administering it?

Dose, 1 or 2 drops, given in the form of pill; which may be made with a crumb of bread. It is safer to give it in divided doses, till it operates. Where a patient is unable or unwilling to swallow, one drop placed on the tongue, will generally operate; and its purgative action may be obtained, it is said, even by rubbing 4 drops around the umbilicus.

What are its effects when applied externally, and how, and for what purposes is it thus used?

It produces inflammation of the skin, with a pustular eruption. Diluted with three parts of olive oil, soap-liniment, or other convenient vehicle, it has been used as a revellent and counter-irritant, in pulmonary diseases; in neuralgia, rheumatism, gout, glandular swellings, &c., applied in the way of a liniment.

2. *Mineral Cathartics.*

Mention these.

The following, though not all strictly mineral, are embraced in this division: sulphur, carbonate of magnesia, magnesia, the saline cathartics and calomel.

SULPHUR.

What is the origin and mode of preparing *crude sulphur* or *brimstone*?

Sulphur is found in all three of the great kingdoms of nature; but it is usually prepared by sublimation, from the native sulphurets of iron and copper, and from sulphur earths, which are found in great abundance, in volcanic regions.

How is crude sulphur purified?

By a second sublimation, in an apparatus so constructed, that it may be condensed, either in the state

of *flowers*—officinal in the last edition of the U. S. Pharm.—or in the liquid state, by the application of more heat; and constituting, when cast into cylindrical sticks, *roll sulphur*, or *cane brimstone*. To free it from sulphuric acid, it is washed with successive portions of boiling water, and then dried, when it is called *washed sulphur*.

Whence is it imported?

Chiefly from Italy and Sicily.

What are its physical and chemical properties?

Roll sulphur is in cylindrical pieces, from two to three inches long, and nearly an inch in diameter; friable, and breaking with a shining, crystalline fracture. *Sublimed sulphur*, or *flowers of sulphur*, is in the state of a very fine powder. It is of a bright yellow color, has a very slight taste, and a peculiar odor, when rubbed. It is a simple substance, insoluble in water and in alcohol, but soluble in the fixed and volatile oils.

What are its effects on the system?

It acts as a gentle laxative and diaphoretic, and from a portion being converted into sulphureted hydrogen, in the bowels, it imparts to the evacuations and the insensible perspiration, a very offensive smell, for some time after its use.

What are its therapeutical applications?

It is employed in hemorrhoidal affections; in chronic rheumatism, gout and catarrh; in cutaneous diseases, and especially in scabies, in which it is used both internally and externally.

What is the dose and mode of administration?

Dose, as a laxative, ʒj. or ʒij.; given in syrup, molasses or milk. Often combined with magnesia or bitartrate of potassa, to assist in its cathartic action.

How is it applied externally?

Usually in the form of an ointment, made by mixing sulphur intimately, with four times its weight of lard, to which a little oil of lemons, or bergamot, may

be added, to conceal its disagreeable odor. Sometimes applied, also, in the state of vapor.

Præcipitated Sulphur.—*Sulphur Precipitatum.*—How is this prepared, and what is its character?

Lac sulphuris, or *milk of sulphur*, as it is sometimes called, is prepared by boiling sulphur with fresh burnt lime, in water; filtering the solution, and dropping into it sufficient muriatic acid to precipitate the sulphur, which is washed with water until it becomes tasteless. It is preferred by some to sublimed sulphur, on account of its freedom from color and its smoothness, being in a state of very minute division; but it is liable to be contaminated with sulphuric acid, from exposure to the air, and frequently contains a large proportion of sulphate of lime; sulphuric acid, instead of muriatic, having been used in its preparation.

CARBONATE OF MAGNESIA.—MAGNESIÆ CARBONAS.

How is this obtained?

It sometimes occurs as a native mineral, but that in the shops is prepared, on a large scale, by decomposing sulphate of magnesia, in solution, with carbonate of soda, or carbonate of potassa.

Whence do we derive our supply of carbonate of magnesia?

Chiefly from Scotland; but a considerable quantity is manufactured in the New England States and in Baltimore.

What are its physical properties?

It is a light, white, inodorous and nearly insipid powder.

What is its relation to water, and its chemical nature?

It is nearly insoluble in water, but dissolves readily in carbonic acid water. It is a compound of 3 eq. of carbonate of magnesia, with 1 of hydrate of magnesia.

What are its adulterations?

Lime, sulphate of lime, silica, &c.

What are its medical properties and uses?

It is antacid, and by combining with acid in the stomach, becomes gently purgative. Used in cases requiring a laxative antacid, and as an antilithic, in excessive secretions of uric acid.

What renders it inconvenient in many cases?

The flatulence which is occasioned by the liberation of its carbonic acid, when it meets with other acids. But in sick-stomach, with acidity, it might prove the more useful by this change.

What is the dose and mode of administration?

Dose, as a cathartic, from 3 ss. to 3 ij.; suspended in water or milk, which may be more uniformly done by first rubbing it with syrup.

MAGNESIA.

How is this prepared?

Magnesia, or *calcined magnesia*, as it is sometimes called, is prepared by exposing carbonate of magnesia to a red heat, in an earthen vessel, till all the carbonic acid is expelled, which is known to have been effected by the absence of effervescence, when vinegar or muriatic acid is added to it.

What are its physical and chemical properties?

It is in the form of a very light, white, inodorous powder, with a slight alkaline taste. It consists of one eq. of magnesium and one of oxygen. Exposed to the air, it absorbs carbonic acid and moisture. It is very slightly soluble in water, but more so in cold than in hot.

What is the most striking peculiarity of *Henry's magnesia*, and the supposed cause?

Its greater density, being at least four times that of ordinary magnesia. Attributable, it is thought, to trituration, or to an intense heat, employed in its calcination.

What is its character as a cathartic?

In full doses, it acts as a gentle cathartic; its operation, however, is uncertain, as it depends on the quantity of free acid it meets in the stomach. From the absence of acid in the stomach, it has accumulated in some instances to a great extent, and even formed concretions in the bowels.

What are its remedial uses as a cathartic?

Much used in constipation, with acidity of stomach, and especially in cases of children. Frequently combined with rhubarb, in bowel complaints.

What is the dose, and best mode of administering it?

As a laxative, for an adult, from $\mathfrak{D}\text{j.}$ to $\mathfrak{z}\text{j.}$; for infants, from 2 to 10 grains, thoroughly triturated with water or milk. When it does not operate from deficiency of acid, lemonade may be taken.

Saline Cathartics.

What is the character of these, and to what cases are they applicable and inapplicable?

They are, for the most part, mild and efficient cathartics, operating on the intestinal exhalents, and producing watery evacuations. They act at the same time as refrigerants or arterial sedatives, and hence, are applicable to inflammatory and active febrile complaints, and inapplicable to typhoid diseases.

SULPHATE OF SODA.—*SODÆ SULPHAS.*

What is this commonly called?

Glauber's salts.

Where is it found, and how is it prepared for medical use?

It is contained in many mineral springs, and its constituents exist in sea-water. It is usually obtained from the salt generated in the formation of muriatic acid. The residuary salt, which is a sulphate of soda, with an excess of sulphuric acid, is dissolved in boil-

ing water, and the excess of acid, either neutralized by the addition of soda, or precipitated by carbonate of lime.

What are its physical and chemical properties?

It is a white salt, crystalizing in four-sided, striated prisms, with dihedral summits. It is inodorous, but has a cooling, saline, very bitter taste. It is composed of 1 eq. of sulphuric acid, 1 of soda, and 10 of water of crystalization. Exposed to the air, it effloresces rapidly; to heat, it first melts in its water of crystalization, then dries, and at a red heat, undergoes the igneous fusion. It is soluble in water, and more readily in warm than cold. Insoluble in alcohol.

What is the dose and mode of administration?

Ordinary dose of the crystalized, \mathfrak{z} j.; of the effloresced, half the quantity. Given, dissolved in water, to which a little dilute sulphuric acid, lemon-juice or cream of tartar may be added to cover its taste. Much less used than the next, on account of its disagreeable taste.

SULPHATE OF MAGNESIA.—MAGNESIÆ SULPHAS.

What is this commonly called?

Epsom Salts.

Where does this occur in nature, and how is it prepared for medical use?

It occurs in great abundance, in the numerous caves west of the Alleghany Mountains; in many rocks; in mineral springs; sea-water, &c. There are several modes of preparation, but the one practised in Baltimore, where it is extensively manufactured from *magnesite*, the siliceous hydrate of magnesia, which abounds in the vicinity of that city, is as follows: "The mineral is reduced to a fine powder, and saturated with sulphuric acid. The mass is then dried and calcined at a red heat, in order to convert the sulphate of iron which may be present, into red oxide. It is then dissolved in water, and sulphuret of lime

added to separate any remaining portion of iron. The salt is crystalized and dissolved a third time, in order to purify it."

What are its physical and chemical properties?

Usually met with in small acicular crystals, transparent and colorless, without odor, but of a bitter, saline taste. It consists of 1 eq. of acid, 1 of magnesia, and 7 of water. It effloresces slowly in the air; exposed to heat, it first melts in its water of crystalization—and at a higher temperature becomes anhydrous, and undergoes the igneous fusion. Soluble in its own weight of water, at 60°, and in three-fourths of its weight of boiling water. Insoluble in alcohol.

What is the dose and mode of administration?

Dose, $\mathfrak{z}\text{ij}$., dissolved in a large quantity of water, to which dilute sulphuric acid may be added, or what is more acceptable to the palate and stomach, in carbonic acid water with lemon syrup.

SULPHATE OF POTASSA.—POTASSÆ SULPHAS.

How is this prepared?

It is prepared, on the large scale, from the salt which remains after the distillation of nitric acid from a mixture of nitre and sulphuric acid. This salt contains an excess of sulphuric acid, which is either expelled by ignition in a crucible, or neutralized by carbonate of potassa, or precipitated by carbonate of lime.

What are its physical and chemical properties?

It is a white salt, crystalizing usually in single or double six-sided prisms, terminated by six-sided pyramids; inodorous, with a bitter, saline taste. The crystals are very hard and are therefore employed in pharmacy for triturating and dividing vegetable powders, as in the case of *Dover's Powders*. It is composed of 1 eq. of sulphuric acid, and 1 of potassa. When thrown on live coals, or heated, it decrepitates, and at a strong red heat, fuses. It requires 16 parts of tem-

perate, and 5 of boiling water, for its solution. Insoluble in alcohol.

What is the dose?

As a purge, \mathfrak{z} ss., but seldom so employed, on account of its difficult solubility.

BITARTRATE OF POTASSA.—POTASSÆ BITARTRAS.

By what other name is this called?

Frequently called *supertartrate of potassa*, *cream of tartar*, and *crystals of tartar*, when crystalized.

What is its source, and mode of preparation?

It is deposited in an impure state, on the inside of casks during the fermentation of acidulous wines. This, which is called *crude tartar* or *argol*, is purified by solution and crystalization a second time.

Whence, and in what state is it imported?

Imported from France, in crystalline crusts.

What are its physical and chemical properties, as kept in the shops?

It is usually in the form of a fine white powder, without odor, but of an agreeable acid taste. It is composed of 2 eq. of tartaric acid, and 1 of potassa, combined in the crystalline state with 1 of water. It is soluble in about 60 parts of cold, and in 15 of boiling water. Insoluble in alcohol.

What are its medical properties, and therapeutical applications?

It is cathartic, diuretic and refrigerant. In large doses it acts as a hydragogue cathartic, and for its hydragogue and diuretic effects, it is much used in dropsical affections, often combined with jalap. Dissolved in water and sweetened with sugar, it forms a pleasant laxative, refrigerant drink in fevers.

What is the dose and mode of administration?

Dose, \mathfrak{z} j. or \mathfrak{z} ij., as an aperient; and from \mathfrak{z} ss. to \mathfrak{z} j., as a hydragogue cathartic, mixed with molasses.

TARTRATE OF POTASSA.—POTASSÆ TARTRAS.

What is the mode of preparing this salt?

Tartrate of potassa, or *soluble tartar*, is prepared by neutralizing the excess of acid in the bitartrate of potassa, with carbonate of potassa. To the latter, in the state of a boiling solution, the bitartrate is added, until the effervescence ceases, when the liquor is filtered and evaporated, so that crystals form on cooling.

What are its physical properties?

When properly prepared, it is in white crystals, but as usually met with, it is in the form of a granular powder, owing to the solution being evaporated to dryness. It is inodorous, with a saline, bitter taste.

What are its chemical properties?

It is composed of 1 eq. of tartaric acid, and 1 of potassa. Exposed to a damp atmosphere, it attracts moisture; to heat, it fuses, and is decomposed, being converted into carbonate of potassa and charcoal. It is decomposed by all the strong acids, and by many acidulous salts. It is soluble in an equal weight of cold water. Soluble also in alcohol.

What are its medical uses?

Not much used at the present day. Occasionally given as a refrigerant laxative in febrile diseases, and sometimes associated with the resinous purgatives, to correct their griping tendencies.

What is the dose?

From ʒ ss. to ʒ j.

TARTRATE OF POTASSA AND SODA.—SODÆ ET POTASSÆ TARTRAS.

What is this commonly called, and how it is prepared?

Commonly called *Rochelle Salt*. Prepared by adding bitartrate of potassa to a solution of carbonate of soda, when the carbonic acid escapes and the soda unites with the excess of acid in the bitartrate, to form

the salt in question, which remains in solution, and is crystalized in the usual way.

What are its physical and chemical properties?

It is in large, white, transparent crystals, which are right rhombic prisms, or more frequently half prisms; inodorous, with a saline, slightly bitter taste. It effloresces slightly in dry air; exposed to a strong heat, it is decomposed, and a mixture of the carbonates of potassa and soda remains. It is soluble in cold, and more so, in boiling water. It is a double salt, composed of 2 eq. of tartaric acid, 1 of potassa, 1 of soda, and 8 of water.

What are its medical properties and uses?

It is a mild, refrigerant aperient, frequently used in febrile diseases, in the form of *Seidlitz powder*, which consists of a mixture of two drachms of this salt, and two scruples of bicarbonate of soda, put up in a *white* paper; and of thirty-five grains of tartaric acid, in a *blue* paper. These are dissolved separately in water, mixed, and taken in the state of effervescence.

What is the dose?

Of tartrate of potassa and soda, from \mathfrak{z} ss. to \mathfrak{z} j.

PHOSPHATE OF SODA.—SODÆ PHOSPHAS.

How is this salt prepared?

It is prepared from bone ashes, or bone earth, which consists of phosphate of lime, with a small quantity of carbonate of lime. This is mixed with sulphuric acid, and macerated in water for three days. The sulphuric acid combines with the greater portion of the lime, and precipitates as sulphate of lime, while the carbonic acid escapes, and the liberated phosphoric acid unites with the undecomposed portion of phosphate, forming a super-phosphate of lime, which remains in solution. To the solution, after being entirely freed from sulphate of lime, by filtration, partial evaporation, cooling and decantation, is added carbonate of soda, to neutralize the excess of phosphoric acid. The car-

bonic acid is disengaged, the soda forms, with the excess of phosphoric acid, phosphate of soda, which remains in solution, and the neutral phosphate of lime precipitates. The liquor is again filtered, and evaporated, so as to crystalize.

What are its physical and chemical properties?

It is in large, transparent, colorless crystals, which have the shape of oblique rhombic prisms; is inodorous, with a cooling, saline, not disagreeable taste. It is composed of 1 eq. of phosphoric acid, 2 of soda, 1 of basic water, and 24 of water of crystalization. It effloresces by exposure to the air; dissolves in four times its weight of cold water, and twice its weight of boiling water, and is nearly insoluble in alcohol.

What are its remedial applications?

It is well suited to cases of children, and persons of delicate stomach, on account of its mild taste.

What is the dose, and best mode of administration?

Dose, as a cathartic, from \mathfrak{z} j. to \mathfrak{z} ij., given in soup or gruel, to which it imparts a saline taste, like common salt.

CALOMEL.

What is the officinal title?

Mild Chloride of Mercury.—*Hydrargyri Chloridum Mite*; under which head, it will be more fully treated of.

What is its character, as a cathartic?

When given alone, it is usually slow, and somewhat uncertain in its operation. It stimulates the liver to increased action, causing bilious stools, and it is to the augmented quantity, and disordered quality of the bile which it produces, that Dr. Wood attributes the severe griping pain, and bilious vomiting, which sometimes attend its action. It does not act in a direct ratio with the dose, three or four grains sometimes operating with as much energy as double or treble that quantity. It acts with less comparative force on infants or young children, than on adults. Some persons are extremely

susceptible to its action; in such cases there is danger to be apprehended, from its excessive action on the mouth.

What are its remedial applications as a cathartic?

It is useful in hepatitis; in inflammation of the stomach and bowels, and in all diseases attended with functional derangement of the hepatic system, as in the commencement of bilious fevers; in bilious colic, jaundice, &c. It is peculiarly suited for children, being easily administered, and generally operating efficiently, without pain.

What are the modes of administration?

It is usually followed, or combined with other cathartics, to ensure its purgative operation. Frequently given at night, in the form of pill, or in powder, mixed with syrup or molasses, and followed by a dose of castor oil, or some saline or other cathartic, on the succeeding morning. Often combined with jalap, rhubarb, aloes, &c., and sometimes with opium, in colic, enteritis, &c.

What is the dose, as a cathartic?

For an adult, from 5 to 20 grains; for a child, two or three years old, 3 to 6 grains. Smaller quantities will generally suffice when combined with other cathartics.

PURGATIVE ENEMATA.

What are the uses of these?

They are employed to hasten, facilitate, or increase the action of cathartics, or to supply their place, where there is unwillingness or inability on the part of the patient to swallow, or of the stomach to retain them, or where, from inflammation of this viscus, they are inadmissible, or from debility of body, there is danger of exhaustion from their operation. Also, used to remove feculent accumulation in the lower bowels, and to relieve habitual constipation, depending on a want of due irritability of the rectum.

What are the substances commonly used for these purposes?

Warm water, barley water, flaxseed tea, soap and water, molasses and water, or gruel, with the addition of salt, or castor oil. The laxative injection commonly used in this country, is composed of *common salt*, *molasses*, and *lard*, or *olive oil*, each a table spoonful, and a pint of warm water. To these, f ʒ ij. of castor oil are frequently added, when a more powerful enema is required. From f ʒ ss. to f ʒ ij. of oil of turpentine, suspended in Oss. of warm water, by means of the yolk of an egg, forms an exciting, purgative clyster, very useful in typhous cases, and in tympanitic states of the abdomen. An injection made by rubbing up ʒj. of assafetida, with Oj. of warm water, will often greatly aid the operation of cathartics, in flatulent or spasmodic colic; and in obstinate constipation, depending on spasm of the intestine, a tobacco clyster is sometimes resorted to, but it is not without danger, and should always be done with great caution. Large quantities of warm water, barley water, or flax seed tea, are sometimes made to operate upon the bowels, by the mere stimulus of distention. Nearly all of the cathartics, in three times the ordinary dose, may be used in this way.

X. DIURETICS.

What are diuretics?

Medicines which augment the urinary secretion.

What are their modes of operation?

They are supposed to act in one or more of three ways: 1, by entering the circulation, changed or unchanged in *transitu*, and stimulating the secreting vessels of the kidneys by direct contact; 2, by acting primarily on the alimentary canal, and secondarily on the kidneys by sympathy; or 3, by promoting absorption, and thus secondarily stimulating the kidneys, by surcharging the blood with serum.

What circumstances are found to modify the action of diuretics, and what practical rules do they suggest?

Their action greatly modified by the state of the skin; so much so, that if the surface of the body be excited by external warmth, after the administration of a diuretic, its action will be diverted from the kidneys to the vessels of the skin, and diaphoresis will be the result. A cathartic action also incompatible with diuresis; consequently some medicines, as cream of tartar, oil of turpentine, &c., which, when given in small doses, properly regulated, act as diuretics, when administered in large doses pass off by the bowels without affecting the kidneys. Diluent drinks favor the action of diuretics, by increasing the bulk of the circulating fluid. Hence, the practical importance of keeping the surface of the body cool, using cold diluent drinks and avoiding catharsis during the administration of diuretics. High arterial excitement and inflammation of the kidneys, are opposed to their action, and demand the use of blood-letting and depletives. Strong mental emotions, as anxious dread or excessive fear, have caused the discharge of urine, and may influence, to some extent, its secretion, but this is of but little practical importance.

What are their therapeutical applications?

They are chiefly used in the treatment of dropsical diseases. Some of them are employed in chronic nephritic affections.

How are they thought to operate in the cure of dropsy?

“Partly by diminishing the quantity of circulating fluids, and thereby promoting absorption; partly as evacuants, reducing arterial excitement, and diminishing the irritation upon which the effusion depends; and partly, perhaps, on the principle of revulsion.” (Wood.)

What are the substances comprised in this class?

Foxglove, squill, meadow-saffron root, and seed, indian hemp, dandelion, juniper berries, fleabane, wild carrot, turpentine, copaiba, spanish flies, some of the salts of potassa, as the carbonates, acetate, bitartrate, and nitrate; spirit of nitric ether, &c.

FOXGLOVE.—DIGITALIS.

What is the character and therapeutical application of digitalis as a diuretic?

It is one of the most efficient diuretics; supposed to act partly by directly exciting the kidneys, and partly by increasing absorption: Much used in dropsy. For dose, &c. see nervous sedatives.

SQUILL.—SCILLA.

What is this?

The bulb of *Scilla maritima*, an herbaceous plant, growing on the shores of the Mediterranean.

What is the character of the bulb, and the mode of preparing it for market?

It is pear-shaped, varying in size from that of the fist to that of a child's head, covered externally with layers of thin, membranous, reddish, or whitish scales, and composed internally of thick, fleshy, concentric

lamellæ, of a white or pale rose color. The entire fresh bulb, is sometimes sent into market packed in sand; but more frequently they are cut into thin transverse slices, and dried quickly with a gentle heat—the outer dry and central mucilaginous scales having been rejected as inert.

What are the physical properties of dried squill, as kept in the shops?

It is in yellowish-white, or white, somewhat translucent slices, brittle when dry, but readily attracting moisture, when they become flexible; inodorous, but has a bitter, nauseous, acrid taste.

What are its relations to water, alcohol and vinegar?

It imparts its virtues to these menstrua.

To what has its virtues been ascribed?

To a peculiar acrid principle called *scillitin*.

What are its effects on the system?

In large doses it acts as an acro-narcotic poison. In medicinal doses it operates as an emetic, expectorant and diuretic.

What are its therapeutical applications as a diuretic?

It is much used in dropsical diseases, generally combined with calomel; the squill exciting the kidneys, and the calomel the absorbents.

What is the dose?

From j. to iij. grains, 2 or 3 times a day, and gradually increased till it produces nausea, whereby its action on the system is evinced and absorption promoted.

MEADOW-SAFFRON ROOT.—COLCHICI RADIX.

MEADOW-SAFFRON SEED.—COLCHICI SEMEN.

What is the character of the plant from which these are obtained, and what is the place of its growth and cultivation?

The *Colchicum autumnale* is a perennial bulbous

plant, flowering in autumn and its seeds appearing in the following spring. It propagates itself by a lateral offset, or new bulb, which begins to form in the latter part of the summer, and grows rapidly at the expense of the parent one. It is a native of the temperate parts of Europe, growing in moist meadows, and is cultivated to some extent in the U. States.

What is the time for collecting the bulb, and the mode of preparing it for market?

It should be collected about the end of July, when it is fully developed, and before its strength is diminished by the offset. It is cut into thin transverse slices and dried with a gentle heat.

What are its physical properties?

The recent bulb, resembles the tulip in shape and size; is solid, white and fleshy internally, and covered with a brown, membranous coat. The dry slices are of a grayish-white color, firm, and with a notch on one part of their circumference. The seeds are small, nearly round, and of a reddish brown color. Both seeds and dry slices are inodorous, but have a bitter, acrid taste.

What are their chemical properties?

The active ingredient, is a peculiar alkaline principle identical with, or closely resembling *veratria*. Their active properties, which in the seeds, reside in their outer coating, are extracted by water, alcohol, vinegar, and wine.

What are the effects of colchicum on the system?

It appears to act as an arterial and nervous sedative, and at the same time stimulates most of the secretions. In full doses it sometimes purges and vomits, and in over doses, acts as an acro-narcotic poison.

What are its remedial applications?

Its chief use, at present, is in the treatment of gout and rheumatism.

What are the forms in which it is used, and the dose of each?

It is seldom given in the form of powder—the dose

is from ij. to viij. grains, usually given in the form of one of the following officinal preparations.

Wine of Colchicum Root—Vinum Colchici Radicis. Prepared by macerating a large proportion of the root in wine, (℥ss. to Oj.) to ensure a saturated tincture. Dose, from 10 drops to f ʒj.; often combined with magnesia, and with morphia.

Wine of Colchicum Seed—Vinum Colchici Semen. Made in the proportion of ʒj. to Oj. Dose, from f ʒss. to f ʒij.

Vinegar of Colchicum—Acetum Colchici. Prepared by maceration or displacement. Dose, from f ʒss. to f ʒj. Less used than the wines.

INDIAN HEMP.—APOCYNUM CANNABINUM.

What is this officinally?

The root of the *Apocynum cannabinum*, an herbaceous, perennial plant, growing in the U. States, along fences and skirts of woods.

What are the sensible properties of the root, and its relations to water and alcohol?

The fresh root has a strong odor, and slightly acid, bitter taste. Water and alcohol extract its virtues.

What are its medical properties and uses?

It is a powerful emetic and cathartic; sometimes acts as a diuretic, diaphoretic and expectorant. It possesses also, narcotic properties. It is used chiefly in dropsy, and has effected cures in several obstinate cases.

How is it given, and what is the dose?

Given in decoction, made by boiling ʒss. of the root, in Oiss. of water, down to Oj. Dose, f ʒj., or f ʒij., 2 or 3 times a day.

DANDELION.—TARAXACUM.

What is this officinally?

The root of the *Leontodon Taraxacum*, an herba-

ceous, indigenous plant, growing in meadows and pastures.

What are the physical properties of the root?

The fresh, full-grown root, is about as large as the little finger, fusiform, of a light brown color, externally, whitish within, and abounds, as also the whole plant, in a milky juice. It is inodorous, but has a sweetish, mucilaginous, bitterish taste.

How is its taste and activity affected by drying?

They are said to be greatly diminished, hence, it should be preferred in the recent state.

What is its relation to water?

Boiling water extracts its virtues.

What are its medical properties and uses?

It is slightly tonic, diuretic and aperient, and is said to be useful in chronic inflammation of the liver and spleen, and in cases of dropsy, dependent upon obstruction of these organs; in some forms of dyspepsia, connected with deficient biliary secretion, &c.

How is it used, and what is the dose?

Used in decoction and extract. Decoction prepared by boiling ℥j. of the dried, or ℥ij. of the fresh root, in Oj. of water, to Oss. Dose, f ℥ij 2 or 3 times a day. The extract, which is officinal, should be prepared from the fresh root, in August. Dose from 20 to 30 grains.

JUNIPER BERRIES.—JUNIPERUS.

From what are these derived?

From the *Juniperus communis*, an ever-green shrub, indigenous in Europe, and naturalized in some parts of this country.

What are their physical and chemical properties?

They are round, about the size of a pea, more or less shrivelled, of a bluish-black color, covered with a glaucous bloom. They have an aromatic, terebinthinate odor, and a sweetish, pungent, terebinthinate taste. Water and alcohol extract their virtues, which

depend on a volatile oil, (*Oleum Juniperi.*) This is separated by distillation, and is of a pale, greenish-yellow color.

What is the character of juniper, as a diuretic, and what are its therapeutical applications, as such?

It is a stimulating diuretic, imparting to the urine the odor of violets. It is chiefly used as an adjunct to other diuretics, in dropsical diseases.

How are they best given, and what is the dose?

Best given in infusion, made by pouring a pint of boiling water on an ounce of the berries, and allowing it to stand till cold. The whole pint may be taken in the course of the day. Frequently associated with cream of tartar. Dose of the oil, from 5 to 15 drops.

FLEABANE.

What is officinal fleabane?

All parts of the *Erigeron Philadelphicum*, *E. heterophyllum*, &c., herbaceous, indigenous plants.

What are the sensible properties of the herb, and its relations to water and alcohol?

It has an aromatic odor, and a slightly bitterish taste. It imparts its virtues to boiling water and to alcohol.

What are its medical properties and uses?

It is a diuretic, used in dropsy, gravel, and other nephritic affections.

How is it administered, and what is the dose?

Given in decoction, made with ℥j. to Oj., the whole to be taken during the day.

WILD CARROT.—CAROTA.

What is this officinally?

The seeds of the *Daucus Carota*.

What is the character of this plant, and where does it grow?

It is a perennial, herbaceous plant, closely resem-

bling the common garden carrot, which is the same plant, somewhat altered by cultivation. It grows wild in Europe, and in this country, along fences and in neglected fields, which, in the months of June and July, are sometimes white with its flowers.

What are the physical and chemical properties of the seeds?

They are small, compressed, ovate, of a brownish color, with a strong, aromatic odor and taste, which depend on a volatile oil. Boiling water extracts their virtues.

What are their medical properties and uses?

They are aromatic and diuretic; used in chronic, nephritic affections, and in dropsy.

How is it used, and what is the dose?

Given in decoction, prepared with half an ounce of the seeds, and a pint of water; the whole taken in 24 hours.

What are the external applications of the root of the garden carrot?

In the form of a poultice, prepared by scraping, it is sometimes applied to phagedenic and cancerous ulcers, to correct their fetor, and to change the character of the diseased action. When boiled and mashed, it forms a mild, emollient cataplasm.

PARSLEY ROOT.—PETROSELINUM.

What are the medical properties and uses of this?

The root of the *Apium Petroselinum*, or common garden parsley, possesses the properties of a diuretic and aperient, and is occasionally used as an adjuvant to more active diuretics, in dropsical and nephritic affections.

How is it used, and what is the dose?

Usually given in the form of a strong infusion, without regard to quantity.

TURPENTINE.—TEREBINTHINA.

What is this?

The juice of different species of *Pinus Abies*, &c.

What are the varieties mostly used in this country?
American or white turpentine, and *Canada turpentine*.

1. *White Turpentine*.—*Terebinthina* of the U. S. Pharm. From what tree is this derived?

Chiefly from the *Pinus palustris*, a large tree growing in the southern parts of the United States.

How is it collected?

In the winter months, holes are cut into the trunk of the tree near the ground, into which the juice flows during the warm season, and from which it is transferred into casks for market.

What are its physical properties, as found in the shops?

It is of a white color, tinged with yellow, slightly translucent, and of a consistence which varies with the temperature. Its odor is characteristic, and its taste warm, pungent and bitterish.

2. *Canada Turpentine*.—*Terebinthina Canadensis*. What is this commonly called, and from what is it derived?

Kept in the shops under the name of *Canada balsam*, or *balsam of fir*. It is derived from the *Abies balsamifera*, or *Pinus balsamea*, an elegant tree growing in Canada and the Northern States, and cultivated as an ornamental tree, under the name of *Balm of Gilead*.

Where is it found in the tree, and how is it collected?

It is contained in vesicles situated between the bark and wood, of the trunk and branches. These are ruptured, and their liquid contents received into a bottle.

What are its physical properties?

When fresh, it is yellowish, transparent, and of the consistence of thin honey; but it gradually concretes, by time and exposure, into a yellow, resinous looking mass. Its odor is agreeably terebinthinate, and its taste bitterish and somewhat acrid.

What are the chemical properties of the turpentine?

They consist of resin and a peculiar volatile oil, called *oil of turpentine*, in the latter of which, their virtues reside. By exposure to the air, they become thick, and ultimately solid, owing to the volatilization and oxidation of a portion of their essential oil. Exposed to heat, they soften, and at a high temperature, take fire, burning with a white flame and much smoke. They are very slightly soluble in water, but wholly so in alcohol and ether.

What are their therapeutical effects and uses?

They are stimulant, diuretic, anthelmintic, and, in large doses, laxative. Applied externally, they act as rubefacients. They are occasionally given in the advanced stages of gonorrhœa and cystitis; in gleet and leucorrhœa; in chronic catarrh, chronic inflammations and ulcerations of the bowels, rheumatism, &c. Sometimes used as an injection, in cases of ascarides, and constipation, with flatulence, \mathfrak{z} ss. or \mathfrak{z} j. being suspended in Oss. of some mucilaginous fluid, by means of the yolk of an egg.

What is the dose and mode of administration?

Dose, from 10 grains to \mathfrak{z} j.; given in pill or emulsion.

Oil of Turpentine.—*Oleum Terebinthinæ.* What are its effects on the urinary organs?

In small doses, frequently repeated, it stimulates the renal vessels, causing an increased flow of urine, to which it imparts a violet odor. It also exerts a specific action on the mucous membrane of the urinary passages, checking excessive mucous discharges, and restoring tonicity to the secretory-vessels. In small doses, too long continued, it is apt to produce stranguery and bloody urine.

What are its remedial uses in reference to the urinary organs?

It is employed in chronic nephritis and cystitis; in

obstinate gleet and leucorrhœa, and sometimes in dropsical effusions, from debility.

What is the dose as a diuretic?

From 10 to 20 drops, 2 or 3 times a day.

Resin.—*Resina.* What is this?

Resin, commonly called rosin, is the residuum after the distillation of the oil from turpentine.

What are the varieties of resin, and the difference between them?

Two varieties: the *yellow* and *white resin*; the latter owing its distinctive qualities to the water it contains.

What are its physical and chemical properties?

It is a semi-transparent, brittle solid, varying from pale yellow to brownish-black, according to purity; and of a faint, terebinthinate odor and taste. It is rendered adhesive by a moderate heat, and fuses at 276°F. It is insoluble in water; soluble in alcohol and ether, and unites readily, by fusion, with wax and the fixed oils. Its ultimate constituents are, carbon, oxygen and hydrogen.

What are its uses?

It is never given internally. It enters, as an important ingredient, in several plasters, cerates, and ointments, rendering them more excitant and adhesive. It forms the basis of *basilicon ointment* or *resin cerate*—*Ceratum Resinæ*.

What are the uses of this cerate?

Used as a gentle stimulant application, to blistered surfaces, to keep up a discharge; to indolent ulcers, burns, &c.

TAR.—PIX LIQUIDA.

Where, and from what, is this prepared?

In the United States, it is prepared principally in North Carolina and the south-eastern parts of Virginia, from the dead wood of the *Pinus palustris*.

What are its physical and chemical properties?

It is a thick, tenacious liquid; of a dark-brown, al-

most black color, with a peculiar odor, and a bitter, somewhat acrid taste. Its most important constituent is *creasote*. It contains, also, a large proportion of resin, a little acetic acid, an empyreumatic oil, and charcoal. It yields its virtues partially to water, forming an officinal infusion, called *tar water*—*Aqua Picis Liquidæ*. Dub.

What are its medical properties and uses?

It is said to possess properties similar to those of the turpentine. It is sometimes given in chronic coughs. *Tar water* was first introduced by Bishop Berkley, as a remedy for diseases of the chest and kidneys. Not much esteemed at present. The vapors of tar, occasionally inhaled with benefit in chronic laryngitic and bronchitic affections, and were at one time highly spoken of as a remedy for phthisis. The chief use of tar, at the present day, is as a local stimulant in chronic cutaneous diseases, especially those which affect the scalp, as *tinea capitis*.

What is the dose and mode of administration?

Dose, from fʒ ss. to fʒ j., made into pills with wheat flour, or into an electuary with sugar; dose of tar water, Oj. or Oij., daily.

How is it applied externally?

The vapors applied by placing tar over a lamp, in some suitable vessel, and boiling it slowly in the chamber, night and day. The previous addition of carbonate of potash to the tar, is advised, to neutralize the pyroligneous acid, which might otherwise excite coughing. Applied in eruptive diseases, in the form of an ointment, (*Unguentum Picis Liquidæ*.)

Creasote.—*Creasotum*. What is this?

A peculiar substance, prepared usually from tar, by a complicated process.

What are its physical properties?

When pure, it is a colorless, transparent, oleaginous liquid, of the consistence of oil of almonds, and the sp. gr. 1.037; volatile, having a smoky odor, and a bitter, acrid, somewhat caustic taste.

What are its chemical properties?

It is a compound of carbon, hydrogen and oxygen. It forms two compounds with water: one a solution of 1.25 parts of creasote in 100 of water; the other, a solution of 10 parts of water in 100 of creasote. It mixes in all proportions with alcohol, ether and acetic acid. It coagulates albumen, and is a powerful antiseptic.

What are its medical properties and uses?

Various properties have been imputed to it, and hence, it has been employed for a contrariety of purposes. The following are some of the diseases in which it has been used: diabetes mellitus, epilepsy, neuralgia, hysteria, hæmoptysis, hæmatemesis, and phthisis. Highly efficacious in sea-sickness, and in allaying nausea and vomiting in other cases, when not dependent on inflammation or other organic disease. Applied externally, in itch, tetters, burns, chilblains, indolent and gangrenous ulcers, and from its power to coagulate albumen, as a styptic in capillary hemorrhages. Used as a gargle in putrid sore throat; as an injection in fistulous ulcers, and in chronic sup-puration of the external meatus of the ear. In tooth-ache it is a valuable remedy.

What is the dose and mode of administration?

Dose, 1 or 2 drops, in mucilage.

How is it applied externally?

Applied in the form of ointment or aqueous solution, made with from 2 to 6 drops to the ounce of distilled water.

COPAIBA.

What is this?

Copaiba, commonly called *balsam of copaiva*, is the juice of different species of *Copaifera*, growing in South America.

How is it procured from the trees?

By making deep incisions into the stems, through which it flows out, and is collected and poured into small casks for exportation.

What are its physical properties ?

When first procured, it is very thin and colorless ; but as usually met with in the shops, it is of the consistence of olive oil, and of a pale yellowish color, with a peculiar, and to many persons, disagreeable odor, and a bitter, hot, nauseous taste.

What are its chemical properties ?

Its chief constituents are, volatile oil and resin, in nearly equal proportions. It contains no benzoic acid, and is therefore improperly called *balsam of copaiva*. The oil is thought to be the active ingredient, and may be separated by distillation. When pure, it is colorless ; has the odor and taste of copaiba ; is lighter than water, and possesses the power of preserving potassium, being free from oxygen. Copaiba is insoluble in water ; soluble in alcohol. Exposed to the air, it gradually thickens, and becomes darker colored. Triturated with about a sixteenth of its weight of magnesia, it becomes sufficiently consistent, in the course of 6 or 8 hours, to be made into pills, thus constituting the officinal *pills of copaiba*—*Pilulæ Copaibæ*. U. S.

What are its medical properties and therapeutical applications ?

It is a special stimulant to the mucous membrane, its action being particularly directed to the bladder and urethra. Its use is sometimes followed by an eruption on the skin resembling urticaria. In very large doses, it vomits and purges. Used in gonorrhœa, leucorrhœa, gleet, chronic irritation and catarrh of the bladder, chronic dysentery, and in other chronic affections of the mucous membranes.

What are the modes of administration, and the dose of each ?

It is usually given dropped on sugar ; sometimes in emulsion with mucilage, sugar and mint, or cinnamon water. It is sometimes administered also, enclosed in capsules of gelatin, to conceal its taste. Dose, from 10 to 30 drops, 3 times a day ; dose of the

volatile oil, 5 to 15 drops; of the officinal pills, 2 to 6, each one containing nearly 5 grains of copaiba.

SPANISH FLIES.—CANTHARIS.

What are the effects of these on the system?

In small or medicinal doses, they act as a stimulant to the uino-genital organs, producing diuresis, and exciting the venereal appetite. In large doses, they are apt to produce strangury, with severe pain and the discharge of bloody urine; and in still larger ones, they act as a powerful irritant poison.

What are their remedial uses internally?

They have been given in amenorrhœa; in dropsy, associated with debility; in gleet, leucorrhœa, seminal weakness, incontinence of urine, arising from partial paralysis of the bladder, &c.

What is the dose of the powder, and of the officinal tincture—*Tinctura Cantharidis*?

Dose of the powder, 1 grain; of the tincture, from 10 drops to f ʒ j., repeated 3 or 4 times a day, in some demulcent fluid.

CARBONATE OF POTASSA.—POTASSÆ CARBONAS.

What is the source and mode of preparing this salt?

An impure carbonate of potassa—*Potassæ Carbonas Impurus*—is obtained from wood ashes, by lixiviation and evaporation. If the lixivium, when evaporated to the consistence of brown sugar, be fused by a powerful heat, it constitutes *potash* of commerce; but if it be calcined, a rather purer salt results, called *pearlash*. The carbonate of potassa is prepared by purifying pearlash, which is effected by dissolving it in cold water; filtering the solution, and evaporating it in an iron vessel until the salt granulates on being stirred.

How is the *pure carbonate of potassa*—*Potassæ Carbonas Purus*—prepared?

By burning a mixture of powdered cream of tartar

and nitre, in a brass vessel, and preparing the pure carbonate from the residue, in the same manner as the carbonate is prepared from pearlash. This is called *salt of tartar*, from its origin.

What are the physical and chemical properties of the carbonate of the shops?

It is in the form of a coarse, white, granular powder; is inodorous, but has a nauseous, alkaline taste. It has an alkaline re-action; attracts moisture from the air, rapidly deliquescing and becoming liquid. It is soluble in its own weight of water, and its solution, on exposure to the air, or on the addition of an acid, deposits flocculi of hydrate of silica. It is insoluble in alcohol.

What are its medical uses?

It is occasionally used as a diuretic, in dropsy; as an antacid, in dyspepsia, and as an antilithic, in excessive secretions of uric acid. It is sometimes used, also, in jaundice; but its most important use is in the formation of the *neutral mixture*, and the *effervescing draught*.

What is the dose and mode of administration?

Dose, from 10 to 30 grains, in sweetened water.

BICARBONATE OF POTASSA.—POTASSÆ BICARBONAS.

How is the *bicarbonate* prepared?

By passing carbonic acid through a solution of the carbonate, till it is fully saturated, then filtering, and evaporating the solution, with a moderate heat, until crystals form.

What are its physical and chemical properties?

It is in the form of white crystals, which have no odor, but a mild, alkaline taste. It is composed of 2 eq. of carbonic acid, 1 of potassa, and 1 of water. It is permanent in the air; exposed to a red heat, part of the carbonic acid is driven off, and it is reduced to the state of carbonate. It is soluble in four parts of cold

water, and in less than its weight of boiling water, with the loss of a portion of its carbonic acid.

What are its advantages over the carbonate?

It is less unpleasant to the taste, and more acceptable to the stomach.

What is the dose?

From 3 ss. to 3 j.

ACETATE OF POTASSA.—POTASSÆ ACETAS.

How is this prepared?

Distilled vinegar or acetic acid is added to a solution of carbonate of potassa, when, by the aid of a gentle heat, the carbonic acid is displaced by the acetic, and escapes with effervescence. The solution is then evaporated, and the pellicles, as they form on the surface, are scraped off and dried.

What are its physical properties?

It is usually met with in white flakes, of a satiny appearance, and a soapy feel; is without odor, but has a warm, saline taste.

What is the effect of exposure, and its solubility in water?

It deliquesces rapidly on exposure, and is very soluble in water.

What are its medical properties and uses?

It is diuretic, and in large doses, cathartic. It is given in dropsy, and under the old name of *sal diureticus*, was highly celebrated as a diuretic in that disease.

What is the dose?

As a diuretic, from ʒj. to 3 j., every 2 or 3 hours.

BITARTRATE OF POTASSA.—POTASSÆ BITARTRAS.

What is its character as a diuretic?

In small doses, largely diluted with water, it is one of the most efficient saline diuretics.

What are its remedial applications as such?

It is much used in dropsical diseases.

What is the dose?

As a diuretic, from \mathfrak{z} j. to \mathfrak{z} ij. may be taken daily, in divided doses.

NITRATE OF POTASSA.—POTASSÆ NITRAS.

What are the therapeutical applications of nitre as a diuretic?

It is applicable to cases of anasarca and ascites, connected with a phlogistic condition of the system.

What is the dose?

As a diuretic, from 10 to 20 grains, repeated so as to amount to \mathfrak{z} j. or \mathfrak{z} ij. in the day.

What are its effects on the stomach, when too long continued?

It is apt to derange the digestive functions, and produce pain in the stomach.

SPIRIT OF NITRIC ETHER.—SPIRITUS ÆTHERIS NITRICI.

What is this commonly called, and how is it prepared?

Commonly called *sweet spirit of nitre*. It may be prepared by distilling a mixture, in due proportions, of alcohol and nitric acid. According to the U. S. Phar., it is distilled from a mixture of *nitrate of potassa*, *sulphuric acid* and *alcohol*, and then re-distilled from carbonate of potassa, to free it from acid, a small quantity of diluted alcohol being previously added, to preserve the measure.

What are its physical and chemical properties?

It is a colorless liquid, with a fragrant, ethereal odor, and a pungent, sweetish, acidulous taste. Its sp. gr. is 0.834. It is very volatile and inflammable, and mixes with water and alcohol in all proportions. It gradually becomes acid by keeping. It is a mixture of hyponitrous ether and alcohol, in variable proportions.

What are the adulterations?

Frequently adulterated with alcohol and water.

What is its character, and therapeutical application, as a diuretic?

It is a mildly stimulating diuretic; given in dropsy, usually combined with other diuretics, such as squill, digitalis, nitre, cream of tartar, &c.

What is the dose and mode of administration?

Dose, from f 3 ss. to f 3 ij. every 2 or 3 hours, in water.

XI. DIAPHORETICS.

What are these?

Medicines which augment the cutaneous exhalation. When they increase it to such a degree as to amount to sweating, they are called *sudorifics*.

What are their modes of operation?

Obstructed perspiration may be associated with two very opposite states of the system—with an excited or languid circulation. In the first case, as in fevers, the surface of the body is morbidly hot and the cutaneous capillaries are constricted; here medicines act as diaphoretics, by lowering the action of the heart and arteries, and relaxing the constricted capillaries. In this way the *antimonials* and *saline diaphoretics* act, and when the arterial excitement is high, their operation will be promoted by venesection. It is in this way, too, that the warm bath, and cold affusions are thought to promote perspiration in fevers, and cold diluent drinks act partly by a refrigerant influence propagated from the stomach to the capillary system, and partly by filling the blood-vessels. In the second case, those medicines which stimulate the cutaneous capillaries, and increase, at the same time, the action of the vascular system, are most likely to prove diaphoretic, especially

when their influence is invited to the surface, by keeping the body warm with flannel. The operation of these is promoted also by tepid drinks.

How may they act beneficially in diseases?

In febrile and inflammatory affections, by depleting from the blood-vessels, and by exerting a sedative and equalizing influence over the circulation; in dropsy, by promoting absorption indirectly; and in many diseases, especially in some of those of the kidneys, by eliminating excrementitious and other noxious matter from the blood.

What is Dr. Wood's division of diaphoretics?

He considers them under the three heads of 1, *nauseating diaphoretics*; 2, *refrigerant diaphoretics*; and 3, *alterative diaphoretics*.

1. *Nauseating Diaphoretics.*

What are these?

Most emetic medicines are diaphoretic in small doses, but ipecacuanha and tartar emetic are the two principally used.

IPECACUANHA.

What is the dose and mode of administering ipecacuanha as a diaphoretic?

Dose, 1 grain, several times a day, but it is rarely given alone; usually in combination with opium, in the form of the officinal *Powder of Ipecacuanha and Opium*—*Pulvis Ipecacuanhæ et Opii*, commonly called *Dover's Powder*.

How is this prepared?

By rubbing powdered opium and ipecacuanha, each one drachm, with an ounce of sulphate of potassa to a very fine powder.

What is the object of the sulphate of potassa?

It is used to effect, by its hardness, a minute divi-

sion and consequent intimate union of the other ingredients.

What is its character as a diaphoretic?

It is one of our most efficient diaphoretics. The opium is said to stimulate the vessels of the skin, while ipecacuanha relaxes them, making the combined effect much greater than that of either, taken separately. The stimulating influence of the opium on the brain and general system, is so modified or counteracted by the ipecacuanha, as that the mixture may be given with safety in cases where the opium alone would be inadmissible.

What are its therapeutical applications?

It is useful in rheumatism; typhoid pneumonia, dysentery, diarrhœa, hemorrhages, dropsy, and in most other cases where diaphoresis is indicated. Contra-indicated by sick or irritable stomach, by cerebral disturbance, or much general excitement.

What is the dose and mode of administration?

Ordinary dose, 10 grains, which contain one grain each, of opium and ipecacuanha. Given in pill or bolus, or mixed with syrup, and the patient not permitted to drink for sometime afterwards, as a precaution against vomiting.

TARTRATE OF ANTIMONY AND POTASSA.—ANTIMONII ET POTASSÆ TARTRAS.

What are its therapeutical applications as a diaphoretic?

It is applicable to febrile complaints, and some cutaneous diseases.

What is the dose and mode of administering it as a diaphoretic?

Dose, from $\frac{1}{8}$ to $\frac{1}{4}$ of a grain—given in a large quantity of water, and repeated every hour or two. Frequently associated with saline remedies, as nitre. Its diaphoretic effects greatest when it induces nausea.

2. *Refrigerant Diaphoretics.*

CITRATE OF POTASSA.—POTASSÆ CITRAS.

How is this salt prepared?

It is readily prepared by saturating a solution of citric acid with carbonate of potassa, but it is usually prepared extemporaneously in solution, as in the formation of the *neutral mixture* and *effervescing draught*.

How are these prepared?

The *neutral mixture* made by saturating Oss. of fresh lemon-juice, with carbonate of potassa, or by dissolving ℥ss. of citric acid in Oss. of water, and adding ℥ij. of oil of lemons, and sufficient carbonate of potassa to saturate the acid.

The *effervescing draught* may be made by adding f ℥ss. of a solution of carbonate of potassa, containing 15 grains of the salt, to f ℥j. of a mixture of equal parts of lemon-juice and water, or of a solution of citric acid of the same strength, and the whole taken in the state of effervescence.

What is the cause of its sometimes failing to effervesce, and how may this be secured?

It is owing to the weakness of the lemon-juice, which unites with only a part of the potassa, and the liberated carbonic acid instead of escaping, combines with the remaining carbonate, forming the bicarbonate. This may be remedied by adding more lemon-juice.

What are the therapeutical applications of these solutions of citrate of potassa?

They are used as refrigerant diaphoretics in fevers, and where these are attended with irritability of stomach, the effervescing draught is especially useful.

What is the dose of the neutral mixture?

Half a fluidounce every hour or two.

SOLUTION OF ACETATE OF AMMONIA.—LIQUOR AMMONIÆ ACETATIS.

What is this commonly called, and how is it prepared?

Commonly called *spiritus Mindereri*, or *spirit of Mindererus*. Prepared by saturating diluted acetic acid with carbonate of ammonia.

What is the objection to the use of common vinegar in its preparation?

It furnishes a solution of variable strength, and of a brownish color.

What are its sensible properties?

When pure, it is limpid and colorless, with a faint odor and a cooling, saline taste.

What are its therapeutical applications as a diaphoretic?

It is applicable to febrile and inflammatory affections.

What is the dose?

From f ʒ ss. to f ʒ j., repeated every 3 or 4 hours?

NITRATE OF POTASSA—POTASSÆ NITRAS.

What are the therapeutical applications of nitre as a diaphoretic.

It is thought to be useful in febrile and inflammatory diseases. Usually combined with tartar emetic.

SPIRIT OF NITRIC ETHER.—SPIRITUS ÆTHERIS NITRICI.

What are its therapeutical applications as a diaphoretic?

It is said to be adapted to febrile complaints, attended with nervous derangement, or typhoid tendencies, and especially for such occurring in children. Some claim for it, excitant properties, rendering it unsuitable in fevers.

What is the dose?

From f ʒ ss. to f ʒ j., every 2 or 3 hours.

3. *Alterative Diaphoretics.*

GUAIAECUM WOOD.—GUAIAECI LIGNUM.

GUAIAEC.—GUAIAECUM.

What are these ?

The wood and concrete juice of the *Guaiacum officinale*.

What is the character of this tree, and its place of growth ?

It is a large tree growing in the West Indies.

What are the physical properties of the wood ?

Guaiacum wood, commonly called *Lignum vitæ*, is imported in logs or billets, which consist of a pale yellow sap-wood, (*alburnum*,) and a dark green heart-wood, (*duramen*;) it is extremely hard and heavy, sinking in water; is without smell, unless when rubbed or heated, when it has an aromatic odor. Its taste is bitterish and acrid. It is kept in the shops in the state of shavings, derived from the workshop of the turner.

What are its relations to water and alcohol ?

Its virtues, which depend chiefly upon the resin or guaiac which it contains, are extracted by alcohol; but only partially by water.

What are the different modes of obtaining the guaiac ?

It is obtained from the tree as a spontaneous exudation, or by incisions made into it; from the wood, by boring a hole through the billets lengthwise, and heating one end in the fire, until the resin melts and flows out at the other; or by boiling the chips and raspings of the wood, in a strong solution of common salt, and skimming off the resin as it rises to the surface.

What are its physical and chemical properties ?

Guaiac is met with in the shops in irregular, semi-transparent, brittle lumps, breaking with a shining, vitreous fracture, of a diversified color, becoming greenish on exposure to the light and air. The odor and taste are

similar to, but stronger than those of the wood. It is said to be a substance *sui generis*, and not a gum-resin, as usually considered. Water dissolves about 9 per cent., alcohol 95; soluble also in ether, and in alkaline solutions.

What are their medical properties and uses?

Guaiac and guaiacum wood are stimulating diaphoretics, used in chronic, rheumatic and gouty affections; in amenorrhœa, secondary syphilis, chronic diseases of the skin and scrofulous affections.

What are the modes of administration, and the doses?

Guaiacum wood is usually given in decoction, which may be made by boiling an ounce of the shavings in a pint and a half of water, down to a pint, the whole of which may be taken in divided doses during the day. Guaiac is given in substance, or in the form of one of the officinal tinctures. Dose of the powder, from 10 to 30 grains, given in pill or emulsion; of the tinctures, *Tinctura Guaiaci*, and *Tinctura Guaiaci Ammoniata*, f ʒj. or f ʒij., in milk, sweetened water, or mucilage.

MEZEREON.—MEZERUM.

What is this?

The bark of the *Daphne Mezereum*, and other specimens of *Daphne*, shrubs growing in Great Britain, and in central and northern Europe.

What are its physical properties as met with in the shops?

The bark, which is derived chiefly from the branches, is in strips of greater or less length, folded in bundles, or wrapped in balls. It is tough, pliable and fibrous, with a brown epidermis, and a whitish inner bark. Its odor is faint, nauseous when fresh, and its taste, at first, sweetish, afterwards extremely acid.

What are its most interesting ingredients, and their relations to water and alcohol?

It contains a peculiar crystalizable principle called *daphnin*, and an acrid resin, to the latter of which its virtues are chiefly owing. These are extracted by alcohol and boiling water.

What are its effects on the system, and its remedial applications as a diaphoretic?

In medical doses, it is an excitant diaphoretic; in over doses, an acrid poison; applied to the skin it excites inflammation and vesication. It is occasionally used in secondary syphilis, chronic cutaneous diseases, &c.

How is it usually given, and what is the dose?

Given in decoction, made by boiling ℥ ij. of mezerion and ℥ ss. of liquorice root in Oij. of water to Oij., the dose of which is f ℥ iv., or a tea-cupful 3 or 4 times a day. It enters into the composition of the Compound Decoction of Sarsaparilla.

SASSAFRAS.

What are the officinal portions of the *Laurus Sassafras*?

The bark of the root—*Sassafras Radicis Cortex*—and the pith of the stems—*Sassafras Medulla*,—are officinal in the U. S. Pharm.

Bark of Sassafras Root. What are the physical properties of the bark as found in the shops, and its relations to water and alcohol?

Usually found in small irregular pieces, very brittle, of a reddish color, a fragrant odor, and a sweetish aromatic taste. Water and alcohol extract its virtues, which depend upon a volatile oil, (*Oleum Sassafras*.)

How is this obtained, and what are its properties?

Obtained by distillation with water. It is of a yellow color, becoming reddish by age; has the odor of sassafras, and a warm, pungent aromatic taste. It is one of the heaviest of the volatile oils (sp. gr. 1.094,) and possesses the power to dissolve caoutchouc.

What are its medical properties and uses?

Sassafras is a stimulant diaphoretic, occasionally used in the form of infusion, as an alterative drink in chronic rheumatism, cutaneous eruptions, and syphilitic and scorbutic affections, but it is chiefly used as an ingredient of the Compound Decoction of Sarsaparilla.

What is the dose of the oil?

From 2 to 10 drops.

Sassafras Pith. What are the properties and uses of this?

It is in slender cylindrical pieces, which are very light and spongy, and have a mucilaginous taste, with a slight flavor of sassafras. It abounds in gummy matter and forms with water a limpid mucilage. This is used as a mild and soothing application in ophthalmia, and as a drink in inflammation of the mucous membranes.

How is the mucilage made?

By adding 3j. of the pith to Oj. of boiling water.

SARSAPARILLA.

What is this?

The roots of several species of *Smilax*, as *S. officinalis*, *S. syphilitica*, &c.

What is the general character of these plants, and where do they grow?

They have a climbing prickly stem, and a rhizoma sending out numerous long, horizontal roots or radicals, which constitute the sarsaparilla of the shops. They inhabit the warm regions of South America, Mexico and Guatemala. The *S. sarsaparilla* is a native of the Southern States, but is thought to be a doubtful source of the sarsaparilla of the shops.

What are the commercial varieties, and the places from which they are imported?

The variety mostly used in this country is the *Honduras sarsaparilla*, so called from its place of export.

Two other varieties are met with here, the *Vera Cruz sarsaparilla*, imported from Vera Cruz and Tampico, and the *Caracas sarsaparilla*, brought from La Guayra.

In what state is it imported, and what are its physical properties as found in the shops?

The roots are brought folded in bundles, and packed in bales containing about 100 lbs. each. As met with in the shops, they are several feet long, about the thickness of a goose-quill, flexible, and wrinkled longitudinally. They consist of a thin epidermis, of a dirty ash or reddish-brown color; a thick whitish or rose colored inner bark—a layer of longitudinal woody fibres, and a central pith. It has scarcely any odor, but a mucilaginous bitterish taste, with a sense of acidity when long chewed.

What are its chemical properties?

It contains a peculiar acid, crystalizable principle, upon which its virtues are supposed to depend, and to which several names have been given, as *smilacin*, *sarsaparillin*, &c. It contains also volatile oil, resin, a large proportion of starch, &c. Its virtues, which reside chiefly in the cortical portion, are extracted by water, cold or hot, but are impaired by long boiling. They are imparted also to diluted alcohol.

What are its therapeutical applications?

It is employed, as an alterative, in chronic cutaneous and scrofulous affections, but chiefly in syphilitic and mercurio-syphilitic cases.

How is it used, and what is the dose?

It is occasionally given in powder, in the dose of from ʒ ss. to ʒ j., but more frequently in the form of the officinal infusion, compound decoction, compound syrup or extract.

Infusion of Sarsaparilla.—*Infusum Sarsaparillæ.*
How is this prepared, and what is the dose?

Prepared by macerating ʒ j. in Oj. of boiling water, or by displacement with cold water. Dose, f ʒ iv. to f ʒ vj., 2 or 3 times a day.

Compound Decoction of Sarsaparilla.—*Decoctum Sarsaparillæ Compositum.* What is the composition and dose of this?

It is a decoction of sarsaparilla, bark of sassafras root, guaiacum wood, liquorice root, and mezereon. Dose, same as the preceding.

Compound Syrup of Sarsaparilla.—*Syrupus Sarsaparillæ Compositus.* What is the composition and dose of this?

It is prepared with sarsaparilla, guaiacum wood, red roses, senna, liquorice root, oil of sassafras, oil of anies, oil of partridge-berry, sugar and diluted alcohol. Dose, f ʒ ss., 3 or 4 times a day.

Extract of Sarsaparilla.—*Extractum Sarsaparillæ.* How is this prepared, and what is the dose?

Prepared by displacement, or by means of alcohol and water, and evaporating to the proper consistence with a gentle heat. Dose, from 10 to 20 grains.

How is the fluid extract of sarsaparilla prepared?

A simple method is, to form a tincture with diluted alcohol by displacement, concentrate it by means of a water-bath, and then add a little alcohol to make it keep.

XII. EXPECTORANTS.

What are these defined to be?

“Medicines which increase the secretion from the mucous membrane of the air cells and air passages of the lungs, or facilitate its discharge.”

How are they conceived to act?

They may increase the secretion by relaxing the secretory vessels when in a state of constriction, or by stimulating them to increased action when in a state of debility, either by a direct influence, or by sympathy with other parts of the system, as with the stomach, larynx, &c. Stimulating medicines may promote expectoration also, when, from debility, the bronchial secretion is excessive, or of an unhealthy character, by imparting tone to the secretory vessels, thus diminishing the quantity or altering the quality of the secretion, and bringing it within the power of the patient to discharge; or by imparting strength to the muscles concerned in expectoration, thus enabling them to act more vigorously in its discharge. Emetics also, by the concussion which they occasion in the act of vomiting, favor the expulsion of mucous and other accumulations from the respiratory organs.

What are the substances arranged under this head?

Some emetic substances, squill, garlic, seneka, black snakeroot, ammoniac, assafetida, balsam of tolu, and balsam of peru.

EMETIC SUBSTANCES.

Which of these are mostly used as expectorants, and to what cases are they applicable?

Ipecacuanha and *tartar emetic* mostly employed, and their relaxing and sedative influence, especially when pushed to the extent of inducing nausea, adapt them for cases of irritation or inflammation of the

lungs and bronchial mucous membrane. Lobelia occasionally given as a sedative expectorant in asthma, whooping cough, &c.

What are the doses of these as expectorants?

Of ipecacuanha, 1 or 2 grains; of wine of ipecacuanha, 30 drops; of tartar emetic, gr. $\frac{1}{8}$; of antimonial wine, 15 to 20 drops; of lobelia, 1 to 5 grains; of the tincture, f 3 ss. to f 3 j.

SQUILL.—SCILLA.

What are the therapeutical applications of squill as an expectorant?

Being but little, if at all stimulant, it is given in the sub-acute and chronic stages of pulmonary inflammation; in the former case, usually associated with tartar emetic or ipecacuanha; in the latter, with some of the stimulating expectorants.

How is it given, and what is the dose?

Sometimes employed in substance in the dose of 1 grain, 3 or 4 times a day, but it is usually given in the form of the *vinegar*, *syrup*, *oxymel*, or *tincture*. Dose of the vinegar, f 3 ss. to f 3 j.; of the syrup or oxymel, from f 3 j. to f 3 ij.; of the tincture, 20 to 40 drops.

What is the mode of preparing the syrup and oxymel from the vinegar?

The syrup prepared by adding sugar to the vinegar and boiling them by means of a water-bath, to the proper consistence. The oxymel prepared in the same way, clarified honey being substituted for the sugar.

GARLIC.—ALLIUM.

What is this officinally?

The bulb of the *Allium sativum*, a native of the south of Europe, and cultivated in our gardens for culinary purposes.

How are the bulbs prepared for market?

They are dug up, with a portion of the stem attached, dried in the sun, and tied together in bunches, for market.

What are its physical properties, as found in the shops?

The bulb, which is somewhat spherical in shape, consists of several small bulbs, called *cloves*, grouped together within a common, dry, whitish, membranous covering. The cloves, which have each a separate covering, are white, fleshy and succulent, of a strong peculiar odor, and a pungent, acrid taste.

What are its relations to water and alcohol, and what is its active ingredient?

Water and alcohol extract its virtues, which depend on a volatile oil.

What is its character as an expectorant, and its remedial applications as such?

Garlic is a stimulating expectorant, used in chronic catarrh, humoral asthma, and other pectoral affections, attended with a debilitated state of the secretory vessels.

How is it administered, and what is the dose?

Best given in the form of the expressed juice, mixed with sugar. Dose, f 3 ss. to f 3 j., for a child. Dose of the officinal syrup, f 3 j. to f 3 ij.

SENEKA.—SENEGA.

What is this?

Seneka, or *seneka snakeroor*, is the root of the *Polygala Senega*, an herbaceous, perennial plant, growing in all parts of the United States, but most abundantly in the southern and western portions, where it is collected for market.

What are the physical properties of the root, as met with in the shops?

It is about the thickness of a writing pen, contorted, knotty and naked, with a projecting line extending along its whole length. The cortical portion is of a

yellowish-brown, or greyish-brown color; the central portion, whitish, woody and inert. The root has a faint, peculiar odor, and a taste at first mucilaginous, afterwards, nauseous and acrid.

What are its relations to water and alcohol?

Its virtues, which reside in the cortical portion, are extracted by water and alcohol.

To what are its virtues ascribed?

To a peculiar acrid principle, called *senegin*.

What are its medical properties, and its therapeutic applications as an expectorant?

It is a stimulating expectorant, and diuretic, and in large doses, emetic and cathartic. Used in chronic catarrh, humoral asthma, in the latter stages of croup, and in the advanced stages of chronic bronchitis and pneumonia; especially when occurring in the aged and debilitated. Contra-indicated by high inflammatory action.

How is it administered, and what is the dose?

Rarely given in powder,—dose of which is from 10 to 20 grains. Usually given in decoction, made by boiling $\frac{3}{4}$ j. of the bruised root, with $\frac{3}{4}$ j. of liquorice root, in Oiss. of water, to Oj., and given in the dose of f $\frac{3}{4}$ j. or f $\frac{3}{4}$ ij., 3 or 4 times a day.

What is the composition, common name, and dose of the *Compound Syrup of Squill*,—*Syrupus Scillæ Compositus*?

It is prepared with squill, seneka, tartar emetic, sugar and water. This, which was formerly prepared with honey instead of sugar, was called *compound honey of squill*, or more commonly *Coxe's Hive Syrup*. Dose, as an expectorant, for an adult, from 20 to 30 drops.

BLACK SNAKEROOT.—CIMICIFUGA.

What is this officinally?

The root of the *Cimicifuga racemosa*, sometimes called *cohosh*, an herbaceous, perennial plant, growing in the woods, throughout the U. States.

What are the physical properties of the root, and its relations to water and alcohol?

It consists of a thick, rough head, with a number of slender radicles; is of a dark-brown color, externally, whitish within, with a peculiar odor, and a bitter, astringent taste. It yields its virtues to boiling water and to alcohol.

What are its therapeutical effects and applications?

It is said to act as a tonic, and to promote, at the same time, most of the secretions. It has been used in dropsy, rheumatism, hysteria, chorea, and in various chronic affections of the lungs.

How is it administered, and what is the dose?

Given in powder and decoction. Dose of the powder, from 10 to 30 grains; of the decoction, made in the proportion of ℥j. to Oj., f ℥j. or f ℥ij., several times a day.

AMMONIAC.—AMMONIACUM.

What is this?

The concrete juice of the *Dorema Ammoniacum*, an umbelliferous plant, growing in Persia.

How is it collected, and by what route does it reach this country?

The juice exudes through innumerable punctures, made by beetles, and concretes on the stems, when it is picked off by the natives. It is sent to Bushire, thence to Bombay, or Calcutta, whence it is imported into this country.

What are its physical properties?

It comes either in roundish tears, or in masses composed of the tears agglutinated together. The tears are of yellowish color externally, whitish within; hard, brittle and breaking with a shining fracture. The lumps are of a darker color, and presents, when broken, whitish tears, imbedded in a brownish substance, and often mixed with seeds, sand and other impurities. The odor is peculiar and nauseous; the taste bitter and disagreeable.

What are its chemical properties?

It is a gum-resin, with a trace of volatile oil; it is softened by heat, and is inflammable; it is miscible with water, forming a milky emulsion, the gum being dissolved, suspends the resin in the mixture. It is soluble in alcohol.

What are its therapeutical applications?

It is used as a stimulating expectorant in chronic catarrh, asthma and other pectoral affections; in the absence of acute inflammation, to increase the secretion from the bronchial mucous membrane, when deficient, or to diminish it, when superabundant, from debility of the vessels. More used as an external stimulant, in the form of plaster, (*Emplastrum Ammoniaci*,) to scrofulous tumors, chronic enlargement of the joints, indolent glandular swellings, &c.

What is the dose, and mode of administration?

Dose, from 10 to 30 grains, usually given in emulsion, sometimes in pill.

What is the character and composition of the *compound pills of squill*?

They are an excellent expectorant, composed of squill, ammoniac, ginger and soap.

ASSAFETIDA.—ASSAFŒTIDA.

What are its properties and uses as an expectorant?

It is one of the most efficient expectorants, its stimulating and anti-spasmodic properties adapting it to spasmodic asthma, hooping-cough, chronic catarrh, chronic bronchitis, and other pectoral affections, with deficient nervous energy in the respiratory apparatus, without acute inflammation.

What is the dose, and mode of administration?

Dose, from 5 to 15 grains, in pill or emulsion.

BALSAM OF TOLU.—TOLUTANUM.

What is this, and how procured?

It is the juice of the *Myroxylon Toluiferum*, a tree growing in tropical America. Incisions are made into the trunk of the tree, and the juice, which exudes, is received into suitable vessels, and allowed to concrete.

What are its physical properties?

When first imported, it is usually soft and tenacious, becoming hard and brittle, like resin, by age. It is translucent, of a yellowish-brown color, and has a peculiar, fragrant odor, and a sweetish aromatic taste.

What are its chemical properties?

Its constituents are resin, volatile oil and benzoic acid, the latter, a characteristic ingredient of balsams. Exposed to the air, it becomes harder; to heat, it melts and inflames, burning with a very agreeable odor. Alcohol dissolves it wholly; boiling water, its benzoic acid.

What are its therapeutical effects and uses?

It is a stimulating expectorant, and in consequence of its pleasant flavor, is much used as an adjunct to cough mixtures; but it should not be used during inflammatory action. In chronic catarrhal affections, the vapor of the ethereal solution, sometimes inhaled with benefit.

What is the dose, and mode of administration?

Dose, from 10 to 30 grains, given in mucilage of gum arabic and sugar. The *tincture* sometimes given in the dose of f ʒ j. or f ʒ ij.; but is said to be an objectionable form for ordinary use, on account of the large proportion of alcohol which it contains.

BALSAM OF PERU.—MYROXYLON.

What is the source, and mode of procuring *Balsam of Peru*?

It is derived from the *Myroxylon Peruiferum*, a tall tree, growing in Peru, and other parts of tropical America. It is said to be obtained from the bark of the tree, by incisions, or from the bark and young branches, by decoction. By the former method, a bal-

sam is obtained, it is said, identical with the balsam of tolu, and by the latter, a dark colored liquid, called *black Peruvian balsam* or *balsam of Peru*.

What are its physical and chemical properties?

It is about the consistence of molasses, of a reddish-brown color, with a fragrant odor, and a warm, bitterish taste. Its chemical properties are the same with those of balsam of tolu.

What are its remedial applications?

It has been used internally, as an excitant expectorant, in chronic, pulmonary and bronchial affections; and externally, as a stimulant to indolent ulcers.

What is the dose, and mode of administration?

Dose, f 3 ss., in emulsion.

How is *Benzoic Acid* separated from the balsams, and what are its properties and uses?

Separated by sublimation; is in soft, white, feathery crystals, of an agreeable odor, and acrid, acidulous taste. Formerly used as a stimulating expectorant, now, only as an ingredient of *paregoric* elixir, and *ammoniated tincture of opium*.

XIII. EMMENAGOGUES.

How are these defined?

“Medicines which promote the menstrual secretion.”

What is their *modus operandi*?

They are believed to act, either by entering the circulation and exerting a direct or specific influence over the uterine vessels, or by the propagation to these, sympathetically, an impression made upon other parts, as upon the rectum and bladder. Many deny the existence of *specific* emmenagogues, and maintain, that amenorrhœa is generally the effect of some morbid state of the body, by removing which, they restore the menstrual secretion, only as *relative* agents. Thus,

tonics and stimulants act in amenorrhœa, from general debility, and venesection, and other depletive measures, in suppression from plethora or inflammation.

What are the substances comprised in this class?

The preparations of iron, aloes, black hellebore, seneka, guaiac, savine and spanish flies.

PREPARATIONS OF IRON.

What is the relative importance of these, as emmenagogues, and to what cases are they applicable?

They are considered to be among the most efficient of the class; applicable to cases of amenorrhœa, dependent on, or associated with, an asthenic condition of the system.

ALOES.—ALOE.

What is the character of aloes, as an emmenagogue, and how is it supposed to act?

Dr. Wood thinks it one of the most effectual emmenagogues, and that it acts both specifically upon the uterus, and, by a sympathetic extension of the irritation which it produces, on the rectum.

To what cases is it applicable, and how is it used?

Adapted for cases of amenorrhœa, with constipation of the bowels, unaccompanied with hemorrhoids, or inflammation of the intestinal mucous membrane. Given in the dose of 1 or 2 grains, 2 or 3 times a day. Sometimes combined with myrrh, some of the preparations of iron, &c. Often used in the form of enema, just before the catamenial period.

BLACK HELLEBORE.—HELLEBORUS NIGER.

What is the character of this, as an emmenagogue?

It is highly esteemed by some practitioners; exciting the uterus by sympathy with the rectum, and probably by a specific influence.

How is it usually given as an emmenagogue, and what is the dose?

Usually given in tincture, in the dose of from f ʒ ss. to f ʒ j., 2 or 3 times a day.

SENEKA.—SENEGA.

What is the character of seneka, as an emmenagogue?

It is said to excite, more or less, all of the secretions, and hence, may prove emmenagogue under some circumstances.

GUAIIAC.—GUAIIACUM.

What is its character as an emmenagogue?

Dr. Dewees placed more reliance on it, in the cure of amenorrhœa, than on any other remedy. Especially useful in amenorrhœa, associated with rheumatism of the neuralgic kind, and in dysmenorrhœa.

How is it given, and what is the dose?

Usually given in the form of one of the officinal tinctures, and in the dose of f ʒ j., 3 or 4 times a day.

SAVINE.—SABINA.

What is this officinally?

The tops of the *Juniperus Sabina*.

What is the character of this plant, and its place of growth?

It is an evergreen shrub, bearing considerable resemblance to the *Juniperus Virginiana*, or common red cedar, which is sometimes substituted for it. It is a native of the south of Europe.

What are its physical and chemical properties, as found in the shops?

It consists of the young tops, with their numerous, small, pointed leaves attached, which are of a yellowish-green color, having a strong, peculiar odor, and a bitter, acrid taste. Water and alcohol extract its virtues, which depend upon a volatile oil, called *oil of savine*,—*Oleum Sabinæ*. This is yellow, strongly odorous, and of an exceedingly acrid taste.

What are its therapeutical effects and uses?

In large doses, it is an acrid poison; in medicinal ones, a powerful stimulant, with a special direction, it is thought, to the uterine organs. Employed as an emmenagogue in amenorrhœa and chlorosis, depending on torpor, or deficient action of the uterine system. It is contra-indicated by much general or local excitement, and by the existence of pregnancy. It is the drug usually resorted to for the purpose of producing abortion, but always at the hazard of the mother.

What is the dose?

Of the powder, from 5 to 15 grains, 2 or 3 times a day; of the oil, from 2 to 5 drops.

SPANISH FLIES.—CANTHARIS.

What is their character and remedial application, as an emmenagogue.

One of the most efficient emmenagogues; useful in amenorrhœa, particularly when complicated with leucorrhœa. Their stimulating properties render them inadmissible in cases with much general or local excitement.

What is the dose?

Of the tincture, from 10 to 30 drops, 3 times a day, gradually increased.

XIV. SIALAGOGUES.

What are these, their modes of operation, and remedial uses?

They are medicines which increase the secretion of saliva. They have been divided into *local* and *remote* or *specific* sialagogues; the former producing the effect by irritating the salivary glands, when chewed; the latter, as the preparations of mercury, by their internal

use, when continued for some time. These, never used for their sialagogue effect. Local sialagogues, or *masticatories*, sometimes employed as revulsives, in rheumatism and neuralgia of the face, tooth-ache, &c., or as direct irritants, in paralysis of the tongue and throat. Many irritating substances are chewed for this purpose.

XV. ERRHINES.

What are these, their modes of action, and remedial uses?

They are medicines which increase the secretion from the pituitary membrane. When they excite sneezing, they are called *sternutatories*. They act upon the same principles as the sialagogues, and are occasionally used as revulsives, in affections of the eyes, head, &c.

What substances are thus employed, and how are they applied?

Tobacco, in the form of snuff, white hellebore, Turpeth's mineral, &c., are used as errhines, snuffed up the nostrils in the form of powder. The two latter should be diluted with five or six parts of some bland substance, as starch, powdered liquorice root, &c.

XVI. EPISPASTICS.

What are these?

Medicines which, when applied to the skin, excite inflammation, followed by an effusion of serum under the cuticle, forming a blister. Frequently called *vesicants* or *vesicatories*.

In what ways do they produce salutary effects in diseases?

They act, 1, as local stimulants; 2, as general stimulants, by sympathy with the local inflammation; 3, as revulsives; 4, as local depletives; 5, by exciting a new action in the diseased part, to which they are applied; and 6, by the pain which they occasion.

What are their therapeutical applications, in reference to each of these modes of action?

As local stimulants, they are useful in partial paralysis, in some cases of threatened gangrene, &c.; as general stimulants, in low or typhoid diseases, and sometimes in intermittent fevers, by subverting morbid action, and preventing the subsequent paroxysm, when employed so as to be in full operation at the time for its recurrence; as revulsives, they prove useful in various nervous irritations, and in inflammation; also, in local determinations of blood, and as local depletives, in erysipelas and many other local inflammations. By altering the nature of the morbid action, in parts to which they are applied, they act beneficially in tinea capitis, obstinate herpes and various other chronic cutaneous eruptions, and by the pain which they excite in hypochondrical cases, &c.

What are some practical rules in relation to the time and part to which they should be applied?

They should not be employed in inflammatory affections, during the existence of high febrile excitement, on account of their stimulating effects. In local inflammations they should be applied near the

seat of the disease, but in local determinations of blood, at a distance from the point of fluxion.

What are the substances belonging to this class?

A number of substances are capable of producing vesication, but the two following are chiefly used for this purpose:

SPANISH FLIES.—CANTHARIS.

Where are these insects found, and how are they collected and prepared for use?

They are found most abundantly in Spain, Italy and the south of France. They make their appearance in May and June, and attach themselves to certain trees, as the white poplar, privet, ash, &c., upon the leaves of which they subsist. Early in the morning, while they are torpid from cold, men, with their faces and hands covered with masks and gloves, shake or knock them from the trees, with poles, and receive them as they fall, upon linen cloths spread underneath. They are then exposed to the vapor of vinegar, to deprive them of life, and afterwards, dried by the heat of the sun or stoves.

What are their physical properties?

They are from six to ten lines in length, by two or three in breadth; are of a golden-green color, affording, when pulverized, a grayish-brown powder, interspersed with numberless shining, green particles of the elytræ. They have a peculiar, disagreeable odor, and an acrid burning taste.

What are their chemical properties?

Its active ingredient is a peculiar, white, crystalline substance, called *cantharidin*. This is insoluble in water and cold alcohol; but these dissolve it, as it exists in combination with the other ingredients of the insect.

What is their liability to be injured by the attacks of insects, and how may it be obviated?

They are very apt to be attacked by mites, which

feed upon their interior, soft parts, and destroy, in a great degree, their activity. Best protected from these, it is said, by keeping them in well stopped bottles, and adding a few drops of strong acetic acid, or a few grains of camphor.

How are cantharides employed externally ?

Usually in the form of one of the following official preparations :

1. *Cerate of Spanish Flies*—*Ceratum Cantharidis*. What are the constituents of this ?

It consists of powdered spanish flies, yellow wax, resin, and olive oil, intimately mixed together.

What is its use and mode of application ?

It is used for blistering, and is commonly called *blistering plaster*. It is applied spread on soft leather, linen, or oiled silk, with a cold spatula, and the margin covered with adhesive plaster to make it adhere to the skin. To prevent the absorption of cantharidin, and its irritating effects on the urinary organs, a piece of gauze or unsized paper may be placed between the plaster and the skin.

How may strangury be prevented, and how best treated when produced ?

Several means of prevention have been recommended, such as the internal use of the decoction of uva ursi, and boiling the flies in water fifteen minutes, which will deprive them of their property of producing strangury, it is said, without affecting their vesicating powers. Where the object is only to produce slight vesication, the chances of producing strangury may be greatly diminished by allowing the blister to remain on only so long as is necessary to excite full redness of the skin, and then applying an emollient poultice to bring out the vesicles. Strangury treated by the free use of diluent drinks, and when severe, an anodyne injection, composed of laudanum and some mucilaginous fluid, may be usefully resorted to.

What time do they require to produce rubefaction and vesication, both on children and adults ?

As a general rule they excite rubefaction on children, in 1 or 2 hours, and on adults, in from 3 to 5 hours. They produce vesication on children, in from 2 to 4 hours, and on adults, in from 6 to 12 hours.

What is the proper management of a blister, both when the object is to heal it, and to maintain the discharge or form what is called a *perpetual blister*?

The vesicles should be punctured to allow the serum to escape, and then dressed with simple cerate, when the object is to heal it speedily; but when a continuation of the discharge is desired, the cuticle should be removed, and the blistered surface dressed with resin cerate, savine cerate, or ointment of spanish flies. Should much inflammation supervene, it may be relieved by emollient poultices or lead water. An indisposition to heal, may be removed by an application composed of equal parts of cerate of subacetate of lead and simple cerate. Deep and extensive ulceration, which sometimes occurs in consequence of general debility, must be cured by the use of tonics and a nutritious diet.

2. *Ointment of Spanish Flies*—*Unguentum Cantharidis*. How is this prepared, and what are its uses?

Prepared by forming a decoction of spanish flies in powder, with distilled water, and with the strained liquor mixing resin cerate and evaporating to the proper consistence. Used as a dressing to blistered surfaces to sustain a discharge.

3. *Plaster of Pitch with Spanish Flies*—*Emplastrum Picis cum Cantharide*. What is this commonly called?

Emplastrum Calefaciens or *warming plaster*.

What are its constituents and uses?

It consists of burgundy pitch and cerate of spanish flies, melted together. Employed as a rubefacient in chronic rheumatism, chronic catarrh, the habitual cough of the old and debilitated, &c.

4. *Liniment of Spanish Flies*—*Linimentum Can-*

tharidis. How is this prepared, and what are its uses?

Prepared by digesting powdered spanish flies in oil of turpentine, for three hours in a water-bath, and straining. Used as an external stimulant in the collapsed stage of typhus fever, &c.

POTATO FLIES.—CANTHARIS VITTATA.

Where are these insects found, and how are they collected and prepared for use?

They are natives of the Middle and Southern States, inhabiting chiefly the potato vine. Early in the morning or late in the evening, they are shaken from the plant into hot water, and then carefully dried in the sun.

What is their shape, size and color?

It resembles in shape, the *C. vesicatoria* or spanish fly, but is rather smaller. The head is of a light red color, with dark spots upon the top, and the body and elytra are black, with yellow longitudinal stripes.

What are its properties and uses?

In sensible, chemical, and medical properties, it resembles the spanish fly, and may be used for the same purposes, and in similar ways.

XVII. RUBEFACIENTS.

What are these?

Medicines which when applied a certain time to the skin, inflame it, without blistering.

In what cases are these said to be preferable to blisters?

In cases where the object is to produce a sudden and powerful, but transient impression, or where a slight but long continued action is desired. They are said to be more useful also as revulsives in spasm and other forms of nervous irritation; and the powerful ones of the class more efficient where the object is merely to produce pain.

What are the individuals of this class?

Mustard, cayenne pepper, oil of turpentine, burgundy pitch, hemlock pitch, and water of ammonia.

MUSTARD—SINAPIS.

What is this officinally?

The seeds of the *Sinapis nigra* and *S. alba*.

What is the character of these plants, and the place of their growth and culture?

They are annual plants, rising from three to four feet high, with small yellow flowers appearing in June. They are natives of Europe, and cultivated in this country.

How are their seeds distinguished?

By their size and color—those derived from the *S. nigra* are small and of a dark brown color, and are called *black mustard seeds*; those from the *S. alba* are much larger, of a yellowish color, and called *white mustard seeds*.

What is the color, taste, and odor of the powder?

It is of a greenish-yellow color, with an oily aspect ; an acrid burning taste, and a faint odor, which is greatly increased by moisture.

What is the chemical composition of mustard ?

They contain mucilage and a bland fixed oil ; the former residing in their skin and may be extracted by boiling water ; the latter in their interior part, obtainable by expression. They also contain a peculiar principle which by the re-action of water, is converted into an acrid volatile oil in the black mustard, and into an acrid substance not volatile in the white. It is upon these principles that their sensible and active properties are thought to depend.

What are its effects on the system, and its remedial applications both internal and external ?

When taken whole, in the dose of a tea-spoonful, once or twice a day, they act as a laxative,—thus used in dyspepsia, &c. The bruised seeds or powder, in the dose of a large tea-spoonful, operates as an emetic. Used for this purpose in cases of great torpor of the stomach, as in narcotic poisoning, malignant cholera, some forms of paralysis, &c. In smaller doses, used as a stimulant to the digestive organs ; but it is chiefly used as a rubefacient. The powder, diluted with an equal portion of wheat flour or rye meal, and made into a cataplasm (*sinapism*) with water, will excite rubefaction in the course of half an hour or hour, and often in less time. Applied in this way to the soles of the feet and calves of the legs, to excite the system in low forms of fever, and to produce revulsion from the head in coma, narcotic poisoning, &c.

What unpleasant effects may result from the incautious application of sinapisms ?

When allowed to remain on too long, they may produce vesication, followed by ulceration and even sphacelus. This should be particularly guarded against, where the patient is insensible to their action.

CAYENNE PEPPER.—CAPSICUM.

What is its character as a rubefacient, and how is it applied?

It is a powerful rubefacient, applied in the form of cataplasm, or more efficiently as a lotion mixed with heated spirit.

What are its remedial uses as such?

Employed in local rheumatism, and as a stimulant in low forms of disease.

OIL OF TURPENTINE.—OLEUM TEREBINTHINÆ.

What is its character as a rubefacient, and the mode of applying it?

It is a speedy and effectual rubefacient. Usually applied hot, when a speedy and powerful effect is desired, but in mild cases diluted with olive oil.

What peculiar effects does it produce on some persons?

In some constitutions it produces violent inflammation of the skin with extensive eruptions.

What are its particular applications as a rubefacient?

It is used as an excitant in low forms of fever with cold skin. As a counter-irritant in inflammation of the viscera; in colic, peritonitis, sore throat, rheumatism, and neuralgia. Sometimes applied to extensive burns, where the vital powers are sinking, mixed with resin cerate, in the form of the *Linimentum Terebinthinæ*.

BURGUNDY PITCH.—PIX ABIETIS.

What is this?

The prepared concrete juice of the *Abies excelsa*, *Pinus abies*, or *Norway spruce fir*, a large, lofty, evergreen tree, growing in Europe and Northern Asia.

What is the mode of preparation?

The tree is deprived of its bark in places, and the juice which flows out and concretes, is removed, melted with hot water, and then strained through coarse cloths. Much of the burgundy pitch of the shops is said to be fictitious, consisting of resin rendered opaque by incorporation with water, and colored with palm oil.

What are its physical and chemical properties as found in the shops?

It is hard, brittle, opaque, of a brownish-yellow color, and a feeble terebinthinate odor and taste. Its consistence varies with the temperature, being harder in cold and softer in warm weather. It melts by heat and is rendered soft and adhesive by the heat of the body. It differs from turpentine in containing less essential oil.

What is its character as a rubefacient?

It acts in most cases as a gentle rubefacient, but on some persons it excites violent inflammation, followed by vesication and even ulceration.

What are its therapeutical uses and modes of application?

Used in chronic rheumatism and chronic affections of the thoracic and abdominal viscera. Applied spread upon leather or cloth, in the form of a plaster, and frequently in the form of the *Emplastrum Pices cum Cantharide*, or warming plaster.

HEMLOCK PITCH.—PIX CANADENSIS.

What is this?

The prepared concrete juice of the *Abies Canadensis*, *Pinus Canadensis*, or *hemlock spruce*, an ever-green tree, growing in Canada and the Northern States.

How is it collected and prepared for use?

The juice exudes spontaneously from the full grown trees and concretes upon the bark. This is removed and boiled in water, and the pitch, which

melts and rises to the surface, is skimmed off. To free it from fragments of bark, it is melted and strained in the shops.

What are its properties?

It is of a dark yellowish-brown color, but in other respects closely resembling burgundy pitch, for which it may be substituted.

WATER OF AMMONIA.—AQUA AMMONIÆ.

How is this prepared, and what is its chemical nature?

Muriate of ammonia is decomposed by slaked lime with the aid of heat, and the ammoniacal gas evolved, is received into distilled water, forming a solution of the sp. gr. 0.96, and containing about $9\frac{1}{2}$ per cent. of ammonia.

What is its odor and taste, and its relation to oils?

It has a strong pungent odor, and a caustic alkaline taste. With oils it forms a liquid soap.

What is its character as a rubefacient, and how is it applied?

It is an active and prompt rubefacient, usually employed, diluted with olive oil, as in the form of the *volatile liniment*—*Linimentum Ammoniæ*. This may be applied by rubbing it gently upon the skin, or placing a piece of flannel, saturated with it, over the affected part.

XVIII. ESCHAROTICS.

What are these, and their modes of operation ?

They are substances which when applied to the body produce an eschar or slough. This they do by chemically disorganizing the part, or by destroying its vitality.

What are their therapeutical uses ?

They are used to excite counter-irritation ; to form issues ; to destroy morbid excrescences ; to produce healthy action in diseased surfaces, by destroying the part affected, and to open abscesses.

How are caustics divided ?

Into *actual* and *potential* cauterants.

1. *Actual Cauterants.*

What are the two forms of actual cautery used ?

The hot iron and moxa.

THE HOT IRON.

What is this used for ?

Iron, heated to whiteness, is sometimes used to destroy morbid growths, but chiefly to arrest hemorrhages in places where a ligature cannot be applied.

How is it applied ?

To protect the surrounding parts from the action of the radiant heat, layers of wet paper should be laid over them, with a hole in the centre, through which, the iron should be quickly applied.

MOXA.

What is this, and how prepared ?

Moxa is the term applied to small combustible masses, intended to be burnt in contact with the skin.

They are prepared with different materials, such as the leaves of some trees, punk, and the pith of the sun-flower; but those mostly used are made of cotton, impregnated with nitre to render them more combustible. The cotton is first impregnated with a strong solution of nitre and dried. It is then formed into a cylinder of half an inch or inch in diameter, by rolling it around a linen cord and securing it by a piece of silk or linen sewed tightly around it. This, when used, is cut into transverse slices of suitable length—from a few lines to an inch.

How is it applied, and what are its principles of action?

The apex is set on fire and the base kept firmly applied to the skin by means of a piece of wire, or a pair of forceps. The surrounding parts should be protected by pieces of wet linen. It is allowed to burn until consumed, when the object is to produce an eschar, but for a shorter time, when it is desired to excite only inflammation. It acts as a powerful revulsive, and as an excitant to neighboring parts.

What are its therapeutical applications?

It has been used in curvature of the spine, in inveterate sciatica and neuralgia, in paraplegia, chronic inflammation of the joints, amaurosis, &c.

2. *Potential Cauterants.*

What substances belong to this division?

Potassa, nitrate of silver, arsenious acid, sulphate of copper, corrosive chloride of mercury, dried alum, and the mineral acids.

POTASSA.

What is the mode of preparing potassa, or *common caustic*?

Liquor potassæ is evaporated till ebullition ceases

and the potassa melts; this is then poured into suitable moulds.

What are its physical properties?

It is generally in pencils, of a grayish or bluish color; inodorous, with a caustic alkaline taste.

How is it affected by exposure, and how best kept?

Exposed to the air it deliquesces rapidly; attracts carbonic acid, and becomes converted into the carbonate. Best preserved in green glass bottles, with ground stoppers.

What are the usual impurities?

Silica, oxide of iron, the sulphate and carbonate of potassa, &c., but they do not unfit it for medical uses.

What is its character as an escharotic?

It is a powerful caustic, but its extreme deliquescence, and consequent liability to spread, render it very unmanageable.

For what is it used?

For opening abscesses, destroying poisoned surfaces, but chiefly for forming issues.

How are issues formed, and upon what principles do they act in the cure of disease?

The skin is covered with two or three layers of adhesive plasters, in the centre of which a hole is cut of the size of the intended issue; through this the caustic is rubbed on until the surface is destroyed; a milk and bread or flaxseed poultice is then applied, and when the slough separates an issue pea is inserted, or some irritating dressing, as savine cerate, is used to keep it open. Issues do good by the revulsion they produce, and in some cases by the discharge.

NITRATE OF SILVER.—ARGENTI NITRAS.

What is its character as an escharotic?

Lunar caustic possesses many advantages as an escharotic. Its mild but effectual action, and the absence of any deliquescent property, or tendency to

spread, render it one of the safest and most manageable caustics that can be employed.

What are its applications?

It is used to destroy fungus growths, warts, corns, strictures in the urethra, incipient chancres, and the surfaces of various unhealthy ulcers. A weak solution—2 to 5 grains in f ℥ j. of distilled water—is used as a local stimulant to indolent ulcers, and as an injection in fetid discharges from the ear, in fistulous sores, gonorrhœa, leucorrhœa, &c.

How is it applied?

As a caustic, usually in the solid state previously moistened. A solution of ℥ j. in f ℥ j. of water will act as a caustic. Solution applied by means of a camel's hair pencil.

ARSENIOUS ACID.—ACIDUM ARSENIOSUM.

By what other names is this called, and how is it obtained?

Called also *white arsenic* and *white oxide of arsenic*. It is obtained as a collateral product during the roasting of cobalt ores, which usually contain arsenic. The arsenic is converted by the combustion, into arsenious acid, which sublimes and condenses on the sides of the flues of the furnace. In this state it is impure and is sublimed a second time.

What are its physical properties?

It occurs in commerce in large transparent vitreous masses, becoming white and opaque on exposure to the air; it is inodorous, has a faintly sweetish taste, and yields a fine white powder, in which state it is kept in the shops.

What are its chemical properties?

It is composed of 2 eq. of arsenic and 3 of oxygen; it is soluble in cold water, and more so in boiling, and its solution reddens litmus paper slightly. The chemical characteristics of arsenious, are as follows: thrown on ignited charcoal it emits an alliaceous odor; heated

with carbonaceous matter in a glass tube, it is reduced, and the metal sublimes and forms a grayish-black ring in the upper, cooler part of the tube; its solution precipitates lemon-yellow with ammoniacal nitrate of silver; grass-green (*Scheele's green*,) with ammoniacal sulphate of copper, and sulphur-yellow (*orpiment*,) with sulphuretted hydrogen.

What is its character and therapeutical application as a caustic?

It is a powerful escharotic, destroying the life of the part and its decomposition is the consequence. But on account of the danger which may accrue from its absorption, it is seldom employed, its use being restricted entirely to malignant and cancerous ulcers.

SULPHATE OF COPPER.—CUPRI SULPHAS.

What are the therapeutical applications of sulphate of copper as an escharotic?

A strong solution made with 20 grains of the salt to f ʒj. of water occasionally used as a mild escharotic to destroy fungus, the callous edges of ulcers, venereal warts, and as an application to chancres in their early stage.

CORROSIVE CHLORIDE OF MERCURY.—HYDRARGYRI CHLORIDUM CORROSIVUM.

What are its external uses?

Bichloride of Mercury, or *Corrosive sublimate*, is sometimes applied as a caustic, mixed with an equal portion of sulphate of zinc, in onychia maligna, but it is mostly used in solution (gr. $\frac{1}{2}$ to gr. 3 to f ʒj.) as a local stimulant to venereal ulcers, to lepra and other scaly eruptions, and as an injection in gleet.

DRIED ALUM.—ALUMEN EXSICCATUM.

How is *dried* or *burnt alum* prepared?

Alum is melted in an earthen or iron vessel over the fire, and the heat continued until it becomes dry, when it is rubbed into powder.

What is its character and use as an escharotic?

It is a mild escharotic, used to destroy fungus flesh, the powder being sprinkled over the surface.

THE MINERAL ACIDS.

What is the character of these as escharotics?

They are powerfully escharotic, but their liquid form renders their application inconvenient.

What are their external uses?

They are sometimes used as caustics in the bites of rabid animals, to destroy warts, and to remove the cuticle hastily, and produce speedy revulsion. Sulphuric and nitric acids diluted, sometimes employed as stimulants to indolent ulcers, and in the form of ointment, in some cutaneous affections.

XIX. DEMULCENTS.

What are these and their uses?

They are substances, which, from their mild and viscid properties when mixed with water, are used to sheath and protect irritated or inflamed surfaces from the action of irritating matters, and by mixing with these to obtund their acrimony. They are used also as diet for the sick, and as vehicles for other medicines.

How are they supposed to do good, where they do not admit of direct application?

In catarrhal afflictions, their soothing influence is probably extended from the top of the larynx to the tracheo-bronchial mucous membrane by contiguous sympathy, but in nephritic diseases, they act as mere diluents.

What are the substances embraced under this head?

Gum arabic, tragacanth, slippery-elm bark, flaxseed, liquorice root, Iceland and Irish moss, sago tapioca, arrow-root, and barley.

GUM ARABIC.—ACACIA.

What is this?

The concrete juice of the *Acacia vera*, and other species of Acacia, small thorny trees or shrubs growing in Arabia and Africa.

How is it obtained?

The juice exudes either through natural fissures in the bark, or through incisions made to facilitate its flow, and concretes on exposure.

What are the places of collection and export?

It is collected in Arabia, Upper Egypt, Barbary, &c., and brought into this country from the ports of the Mediterranean.

What are the commercial varieties?

The two principal are *Turkey gum* and *Senegal gum*.

What are the physical properties of each of these varieties?

Turkey gum consists chiefly of small, irregular, very brittle fragments, of a whitish or yellowish-white color, and with numerous fissures, impairing its transparency. *Senegal gum* is usually in roundish or oval pieces, larger than those of the Turkey gum, more transparent, less brittle and pulverizable, and of yellowish or reddish color. Both afford a white powder, are inodorous and have a feeble taste.

What are its chemical properties?

It consists chiefly of gum, which is insoluble in alcohol, but soluble in water, either cold or hot, forming a viscid solution called mucilage, which, when long kept, becomes sour from the generation of acetic acid.

What is its character as a demulcent and its therapeutical applications as such?

It is an excellent demulcent, much used in the form of solution, in irritation and inflammation of the mucous membranes, and especially that of the stomach and bowels.

What are its dietetic and pharmaceutical uses?

A solution made with ℥j. of gum to Oj. of water, is an excellent article of diet in febrile and other affections requiring a strictly antiphlogistic regimen. Used in pharmacy for suspending heavy insoluble substances in water, and for forming pills and troches.

TRAGACANTH.—TRAGACANTHA.

What is this?

The concrete juice of the *Astragalus verus*, and other species of *Astragalus*, small thorny shrubs growing in Persia, Asia Minor, &c.

What is the mode of collection?

It exudes spontaneously during the summer from the stems and branches, and hardens on the surface.

What are its physical and chemical properties?

It occurs in thin plates, of a whitish or citron-yellow color, semi-transparent, hard, and of difficult pulverization, except at a temperature of 100° or 120°, or at a freezing temperature. It is inodorous and tasteless; is very partially soluble in water, but when mixed with it, it swells up and forms a soft adhesive paste. It consists chiefly of gum and bassorin.

What are its uses?

It is seldom given internally, on account of its difficult solubility in water. Used principally for the suspension of heavy insoluble powders in water, and to impart consistence to troches.

SLIPPERY-ELM BARK.—ULMUS.

What is this officinally?

The inner bark of the *Ulmus fulva*, slippery-elm or red elm, a lofty indigenous tree.

What are its physical properties ?

It is found in the shops in long, nearly flat pieces, freed of the epidermis ; of a fibrous texture, a reddish-yellow color, a sweetish odor, and a highly mucilaginous taste, when chewed.

What are its relations to water ?

It imparts the mucilaginous matter, in which it abounds, to water, forming a thick mucilage.

What are its therapeutical applications, both internal and external ?

It is an excellent demulcent, and may be used in all cases for which such medicines are adapted. In the form of poultice, made by adding hot water to the powder, it is sometimes used as an emollient application to inflamed surfaces.

How is it usually given ?

In infusion, made in the proportion of $\mathfrak{z}j.$ to $Oj.$

FLAXSEED.—LINUM.

From what is this derived ?

From the *Linum usitatissimum*, or common flax.

What are the most important constituents of flax-seeds ?

They contain mucilage and a fixed oil ; the former residing in the skin, the latter in the nucleus.

How is the oil obtained, and what is it commonly called ?

Obtained by expression ; commonly called *Linseed oil*—*Oleum Lini*. U. S.

What are the properties and uses of the oil ?

It is of a yellowish-brown color, a faint disagreeable odor, and nauseous taste. On exposure to the air, it concretes into a transparent varnish, and hence, is called a *drying oil*. As a medicine, it is sometimes added to purgative enemata, and applied to burns, mixed with an equal portion of lime-water, as in the *Lini-mentum Calcis*. In the arts, it is extensively used for painting and printing.

What is the character of flaxseed as a demulcent, and how is it used?

It is an excellent demulcent, much used in the form of an infusion, made in the proportion of ʒj. to Oj. of boiling water.

What are the uses of the powdered seeds?

Flaxseed meal mixed with hot water, is used as an emollient poultice.

LIQUORICE ROOT.—GLYCYRRHIZA.

LIQUORICE.—EXTRACTUM GLYCYRRHIZÆ.

What are these?

The root and extract of the root of the *Glycyrrhiza glabra*, an herbaceous, perennial plant, growing in the south of Europe.

Whence is liquorice root imported, and what are its physical properties, as found in the shops?

Much of it is said to come from the ports of Messina and Palermo, in Sicily. As met with in the shops, it is in long pieces, about the thickness of the little finger, wrinkled, and of a grayish-brown color, externally, yellowish internally, and affording a grayish-yellow powder, when pulverized. It is without odor, but has a sweet, mucilaginous, subacid taste.

What is its relation to water, and its characteristic ingredient?

Boiling water extracts its virtues. Its characteristic principle, a peculiar sweetish substance called *glycyrrhizin*, differing from sugar in not being susceptible of the vinous fermentation.

What is its character as a demulcent, and its remedial uses as such?

It is an excellent demulcent, used in irritation of the mucous membranes. It is frequently added to the decoctions of seneka, mezercon and other acrid vegetable substances, to conceal their acrimony.

How is it used?

In the form of decoction, prepared by boiling ʒj. of the root, for a few minutes, in Oj. of water.

What are the uses of the powdered root?

It is used in the preparation of pills.

How is the extract prepared, and whence imported?

Prepared by boiling the root in water, and evaporating the strained decoction. Imported chiefly from Messina and Leghorn.

What are its physical properties?

It comes in cylindrical or flattened rolls, covered with bay leaves; brittle, breaking with a shining fracture; very black, and of a sweet, bitterish, sub-acrid taste.

What are frequent impurities, and how are they separated?

It sometimes contains sand, starch, prune juice, copper, &c.; from which it is purified by solution in water, filtering and evaporating.

What is the shape and size of the pieces of refined liquorice?

It is in small, cylindrical pieces, about the thickness of a pipe stem.

What are its uses?

It is used in coughs, and bronchial affections, being allowed to dissolve slowly in the mouth. Frequently added to cough mixtures, and to infusions or decoctions, to conceal or modify the taste of other medicines. Used also, to impart consistence to pills and troches.

ICELAND MOSS.—CETRARIA.

Where is this plant found, and what are its physical properties, as met with in the shops?

It is found in the northern regions of both the new and old worlds. It is a small, foliaceous plant, of a coriaceous consistence. As met with in the shops, it is of a brownish or grayish-white color. It has a faint odor, and a mucilaginous, bitter taste.

What are its chemical properties?

Its most important ingredients are a peculiar starch-like principle, (*lichenin*,) a bitter principle, (*cetrarin*,)

gum, uncrystalizable sugar, &c. The bitter principle is separable by maceration in water, or in a weak alkaline solution; the gum and starchy matter, extracted by decoction, which, on cooling, acquires a gelatinous consistence.

What are its therapeutical effects and uses?

It is demulcent and tonic, with nutritive properties. Useful in diseases of the mucous membranes, accompanied with general debility, or an enfeebled condition of the digestive organs, as in chronic bronchitis and catarrh; in chronic dysentery and diarrhoea; in dyspepsia, pulmonary consumption, &c.

What is the form of administration, and the dose?

Usually given in decoction, made by boiling Oj., in Oiss. of water, to Oj., and the whole taken in divided doses, during the day.

IRISH MOSS.—CHONDRUS.

Where is this found, and what are its properties and uses?

It is found most abundantly, growing on the rocks on the south-west coast of Ireland, where it is gathered, dried and bleached in the sun for use. It somewhat resembles Iceland moss, in properties, but is more mucilaginous, and less bitter. A decoction, made in the proportion of $\frac{3}{4}$ ss. to Oj., is frequently used as a substitute for that substance.

SAGO.

What is this?

The prepared fecula of the pith of the *Sagrus Rumphii*, or *sago palm*, a tree growing in the East Indies.

How is it prepared?

The pith is collected from the tree in the state of a coarse powder, and the fecula separated from it, by repeated washings with water, over a hair seive. The milky liquor which passes through, is allowed to stand until the sago is deposited, when the water is strained off, and the paste afterwards rubbed into grains.

What are the varieties of sago, and the physical properties of each?

Two varieties—*pearl sago* and *common sago*; the former, in hard, whitish grains, about the size of a pin's head; the latter, in larger size grains, of a brownish color. It has a feeble odor, and but little taste.

What is its chemical nature, and its relation to water?

It consists almost entirely of starch. It is insoluble in cold water, but forms a gelatinous solution with boiling water.

What are its uses, and modes of exhibition?

It is used as a mild and digestible article of diet, in febrile diseases, and in convalescence from acute disorders. Used in decoction, made by boiling ʒj. of sago in Oj. of water or milk, and seasoning with sugar and nutmeg, or other spices, where these are not contra-indicated.

TAPIOCA.

What is this?

The fecula of the root of the *Jatropha Manihot*.

What is the character of this plant, and its place of growth and culture?

It is a small shrub, with a very large, fleshy, tuberous root; indigenous in Brazil, and cultivated in the West Indies, under the name of *Cassava*.

How are the plants distinguished?

By the names of *sweet* and *bitter*. The root of the latter, abounds in an acrid, milky juice, which is poisonous.

How is the tapioca prepared?

The juice is obtained from the rasped root, by expression, and allowed to stand until it deposits the fecula; this is repeatedly washed with cold water, to free it from the poisonous juice, and then dried on hot plates.

What are its physical and chemical properties?

partially soluble in cold water, diffuses a thick milky fluid from sago, owing to the exposure to heat

It is supposed, the reason starch is not soluble in cold water, that the exterior of the little granules is requires heat to rupture and then the DEMULCENTS. are written 257 are mixed in a dish with water.

It is in hard, irregular grains or fragments, whitish, inodorous and tasteless. It is nearly pure starch.

How, and for what is it used?

Used in the same way as sago, and for similar purposes.

ARROW ROOT.—MARANTA.

What is this?

The fecula of the root of the *Maranta arundinacea*, a native of South America and the West Indies, where it is largely cultivated.

What is the mode of preparation?

The fresh root, cleansed, is beat into a pulp, and the fecula separated by means of water, in the usual way, and dried in the sun.

What are its physical and chemical properties?

It is in the form of a white powder, or pulverulent masses, and is without odor or taste, when free from mustiness. Examined by the microscope, it is seen, like the other varieties of fecula, to consist of small granules. It is identical in chemical properties, with wheaten starch, but forms a firmer jelly with boiling water.

What are its uses?

It is much used as a mild and digestible article of diet for the sick and convalescent; well adapted, from its demulcent properties, for diseases of the alimentary canal. Used also, as food for infants.

How is it prepared for use?

A table-spoonful may be made into a paste with a little cold water, and then mixed with Oj. of water boiling, and continued so for a few minutes. It may be flavored with sugar and lemon-juice, and in some low forms of fever, wine and spices may be added. It is usually prepared with milk, for children.

BARLEY.—HORDEUM.

What is barley, and how is it prepared for use?

It is the decorticated seeds of several species of *Hordeum*, small plants cultivated in the United States and other parts of the world. The seeds are deprived of their husk, and then rounded and polished in a mill of a peculiar construction.

What is it called as thus prepared, and what are its physical and chemical properties?

Called *pearl barley*—*Hordeum perlatum*. It is in small round grains; of a pearly whiteness, without odor, but of a sweetish, mucilaginous taste. It consists chiefly of starch, with some gluten, gum, sugar, &c. Boiling water extracts its virtues.

What are its uses?

It is used in the form of decoction, as a nutritive and demulcent drink, in febrile and inflammatory affections, as a vehicle for other medicines, and to give bulk to enemata.

How is the decoction prepared?

The officinal decoction—*Decoctum Hordei*, commonly called *barley water*—is prepared as follows: Two ounces of barley is first washed with cold water, and then boiled in another portion for a short time, to free it from all extraneous matters, mustiness or other unpleasant flavor. This water is thrown away, and four pints of boiling water added and boiled down to two pints, and strained.

XX. EMOLLIENTS.

What are these, and their uses?

They are substances which diminish the tone or cohesion of the living tissues to which they are applied, and thereby render them more lax and flexible. Opposite in their effects to astringents. They are used to sooth inflamed parts, and to promote suppuration.

water is a powerful sedative, applied at the time of the nature of the body—

What substances are chiefly used for these purposes ?

Warm, mild cataplasms, such as those prepared with flaxseed meal and hot water ; powdered slippery-elm and hot water ; milk and the crumb of bread ; mush of indian corn meal, &c. Warm water, especially in the form of vapor, is also much used.

XXI. DILUENTS.

What are these, and their uses ?

They are mild, watery liquids, which serve to dilute the contents of the stomach and bowels, to increase the fluidity of the blood, and to increase, and at the same time, dilute the secretions. Used, therapeutically, in febrile and inflammatory affections, and are especially serviceable when the inflammation is located in the alimentary or urinary mucous membrane. They are used, also, to dilute acrid and corrosive poisons, which destroy by inflicting local mischief.

XXII. PECULIAR MEDICINES.

What medicines are considered by Dr. Wood insusceptible of accurate classification ?

Ergot, nux vomica, arsenic, mercury and iodine.

ERGOT.—ERGOTA.

What is this ?

Ergot, secale cornutum, or *spurred rye*, is derived from the *secale cereale*, or common rye, and is thought by some, to be the diseased seed, by others, the degenerated seed, mixed with a species of fungus.

What are its physical properties ?

*Incompat. acetate & subacetate of lead & tincture of
opium*

It is in brittle, somewhat flexible grains, from the third of an inch to an inch and a half in length, by one or two lines in thickness; usually curved like the spur of a cock, whence the name. It is marked with a longitudinal furrow, on one or both sides; is of a violet-brown color externally, yellowish-white internally, with a peculiar fishy odor, and a slightly acid, disagreeable taste. It is liable to be attacked and destroyed by small insects. *internal structure exhibits minute cells filled with oil*

What is its active ingredient, and the relation of this to water, and to alcohol?

Its virtues are supposed to depend on a peculiar fixed oil, which is extracted by water and alcohol.

What are its medical properties and uses?

generally used in the form of capsules
In medicinal doses, it exerts a specific influence on the uterus, increasing its contractile power. In very large doses, it is said to act as a narcotic. It is used to accelerate delivery, when delayed from feeble or languid contractions of the uterus, and to cause the expulsion of the placenta retained from a similar cause; to promote the expulsion of sanguineous clots, hydatids and polypi; to restrain uterine hemorrhages, &c. Contra-indicated in parturition, by the want of dilatation of the os uteri, great rigidity of the soft parts, deformity of the pelvis, and mal-presentation.

What evil consequences have been known to result from its free and long continued use?

Dry gangrene, typhus fever, and great disorder of the nervous system, have resulted, and even prevailed epidemically, in some parts of Europe, from the use of rye bread contaminated with it.

How is it given, and what is the dose?

Usually given in powder and infusion. Dose of the powder, for a woman in labor, 10 to 20 grains, repeated every twenty minutes, until its effect on the uterus is produced, or 3j. has been taken; dose of the infusion, prepared with 3j. to Oj., one-third.

detractions particularly upon the capsule

Brucia is crystallisable without smell; harsh bitter taste, slightly soluble in water, very soluble in alcohol, insoluble in ether and fixed oils - melts at a little above 212° -

NUX VOMICA.

What is this?

The seeds of the *Strychnos Nux Vomica*, a moderate sized tree growing in the East Indies.

What is the character of the plant?

It is a round smooth berry, resembling in size and color, the orange, and containing numerous seeds imbedded in a juicy pulp.

What are the physical properties of the seeds?

They are flat, circular, nearly an inch in diameter, and two or three lines in thickness; concave on one side and convex on the other. They consist of an external fragile coating, thickly covered with short, satiny, yellowish hairs; and an internal hard, horny nucleus, of a whitish or yellowish color. They are of difficult pulverization; are inodorous, but have an acrid, very bitter taste.

What are its chemical properties?

Its active ingredients are two peculiar alkalies, called *strychnia* and *brucia*. These are extracted by water, but more readily by diluted alcohol.

In what other substances are these alkalies found, and how do they differ?

They exist, also, in the bean of St. Ignatius, and *brucia* is found in false *Angustura* bark. They are nearly similar in medicinal properties, but differ in strength, *brucia* being much weaker.

What are the properties of *strychnia*?

It is in the form of white grains or crystals; is inodorous, but has an intensely bitter taste. It is decomposed by heat, is soluble in a large proportion of water, and readily soluble in alcohol.

What are the effects of *nux vomica* on the system?

It appears to excite specifically the nerves of motion through the medium of the spinal marrow, as indicated by the spasmodic twitching of the voluntary muscles when the system is brought under its influence.

It is a very active poison, *strychnia* being, with the

in small doses tonic, demulcent and occasionally cathartic and purgative -

- from berries by heat and being then steam-distilled and separated by ether - last & latter rubbing in a mortar -

closure of heart, in stomach, constriction of throat and abdomen, tightness of chest and retention of urine are frequently experienced—

exception of prussic acid, the most violent one known. The symptoms of its poisonous effects are simply those of tetanus and asphyxia.

What are its therapeutical applications?

It is chiefly employed in the treatment of paralytic affections, in which it has often proved successful when unattended with inflammation or other organic lesion of the brain or spinal marrow. It more frequently acts beneficially in general than in partial paralysis, and in paraplegia than in hemiplegia.

What is the dose of nux vomica, and its preparations?

Dose of the powdered seed, 5 grains; of the alcoholic extract, from $\frac{1}{2}$ to 2 grains; of strychnia, from $\frac{1}{2}$ to $\frac{1}{6}$ of a grain; of brucia, j. grain.

For what is strychnia used externally, and how is it applied?

It has been used in amaurosis, applied by the endermic method. *gr. ss to temple, night and morning—*

ARSENIC.—ARSENICUM.

What are the effects of arsenic on the system?

In the metallic state it is thought to be inert, but in combination, alterative, tonic and antiperiodic. Under the continued use of the arsenical preparations a feeling of stiffness of the face and eyelids are experienced, attended with an edematous swelling of these parts called *œdema arsenicalis*; itching of the skin, soreness of the mouth, loss of appetite, and uneasiness and pain in the stomach and bowels. In over doses they act as powerful irritant poisons, producing inflammation and disorganization of the gastro-intestinal, mucous membrane, attended with great general prostration, and a number of distressing symptoms. The same effects may be produced by its absorption when applied externally.

How are its poisonous effects best counteracted?

If the stomach-pump beat hard it should be im-

It is generally given in form of a solution in water or alcohol.

mediately used, and the *hydrated oxide of iron*, which is the best antidote should be given in all cases. For the mode of preparing, preserving, and exhibiting this, see page 80. Mucilaginous drinks should be freely given, and inflammation succeeding, combated on general principles.

What are its remedial applications?

It is used internally in diseases of an intermittent character, as ague, some forms of neuralgia, chorea, periodic headache, &c.; in some cutaneous diseases, particularly those of a scaly character; and in secondary syphilis; contraindicated by irritation or inflammation of the stomach, and by debility.

What two preparations of arsenic are chiefly used?

Arsenious acid and *Solution of Arsenite of Potassa*—*Liquor Potassæ Arsenitis*.*

How is the latter prepared?

Fowler's solution, as it is commonly called, is prepared by boiling arsenious acid and carbonate of potassa in distilled water until the acid is entirely dissolved, and adding to the solution, when cold, a little compound spirit of lavender, to give it color and flavor.

What is the dose of each of these preparations?

Of arsenious acid, gr. $\frac{1}{16}$, made into pill with crumb of bread; of Fowler's solution, 10 drops, both to be repeated 2 or 3 times a day.

MERCURY.—HYDRARGYRUM.

What are the effects of mercury on the system?

In its metallic or uncombined state, it is considered inert, but in its various forms of preparation, it acts very peculiarly. Administered in very small doses it acts as an alterative; in somewhat larger doses often repeated, it produces certain constitutional effects, characterized by a quick jerking pulse, increased nervous sensibility, invigorated absorption, and an increase of

the secretions, particular that of saliva constituting *salivation* or *ptyalism*.

What are the symptoms which announce its constitutional effects?

A metallic or brassy taste in the mouth; redness, soreness and tumefaction of the gums with a whitish matter along their edges; a disagreeable sensation in the sockets of the teeth when the jaws are pressed together, and peculiar fetor of the breath called the mercurial fetor, followed by an increased flow of saliva.

What are the effects of excessive salivation, and the remedies for it?

The symptoms of its excessive action are severe pain in the jaws, swelling and ulceration of the cheeks, tongue and throat, accompanied with a copious flow of saliva, amounting sometimes to several pints in the day, slow fever and rapid emaciation; gangrene and sloughing of the soft parts of the mouth and throat, loss of the teeth, caries of the bones of the face, with horrible deformity, have resulted from its abuse. The remedies for excessive salivation, are astringent and detergent gargles, such as lead-water, weak solution of creasote, chloride of soda or of lime.

How do persons differ in their susceptibility to its action?

While a few person are totally insensible to its action, others are met with who are extremely susceptible, the smallest quantities in some instances producing salivation. On some individuals, too, it appears to act as a poison, causing a vesicular eruption called *eczema mercuriale*, and sometimes a febrile condition characterized by great adynamia termed *mercurial erethism* by Mr. Pearson, who first described it, in which a sudden emotion or physical exertion may prove fatal.

Upon what principles does mercury act in the cure of diseases?

It is absorbed, and is supposed to do good in several ways; principally by its influence over the secretions, particularly that of the liver; by promoting absorption, but above all, by a general revolutionizing action, or by substituting its own action for that of the disease.

What are its therapeutical applications?

It has been used in a variety of diseases; the following are some of them: functional derangement and inflammation of the liver, whether attended with a deficient or superabundant secretion of bile; syphilis, colica pictonum, paralysis, dysentery, and various other nervous and inflammatory affections. It is thought to be particularly adapted for those forms of inflammation which frequently result in the effusion of coagulable lymph, or of serum; as croup, laryngitis, bronchitis, pleuritis, pericarditis, peritonitis, meningitis, &c. Its use in these cases should be preceded by blood-letting, and so regulated as to produce a slight impression on the gums, which, when maintained, will be sufficient in a great majority of cases. Its alterative action is often only required.

How is it used as an alterative, and to induce its specific effects?

As an alterative, from a quarter of a grain to a grain of calomel, or two or three grains of blue pill, may be given every night, or every other night, and to produce a gentle ptyalism, one grain of the former, or from 3 to 5 grains of the latter, may be administered three times daily. In the former case, the bowels should be kept open by mild laxatives; in the latter, purgation should be prevented by opium, otherwise, the mercury may pass off by the bowels, without affecting the system. Where circumstances forbid its internal use, it may be applied externally. For this purpose, 3j. of mercurial ointment may be rubbed on the inner surface of the thighs and arms, twice a day. In this way it is frequently employed conjointly with the internal use of the drug, where a speedy or powerful impression is desired, and in such cases, the oint-

ment is sometimes applied to the surface, deprived of the cuticle, to facilitate its absorption.

In what states is mercury employed?

In the metallic state, mixed with other substances; in the state of oxides, chlorides, salts, sulphurets and iodides.

1. *Metallic Mercury.*

What are the officinal preparations containing metallic mercury?

Mercurial ointment, plaster and pills, and mercury with chalk.

In what state is the mercury supposed to exist in these preparations?

In a state of minute division, with some slight degree of oxidation.

1. *Mercurial Ointment—Unguentum Hydrargyri.* How is this prepared?

By rubbing purified mercury, with lard and suet, until the globules disappear. *equal parts*

What is its color when first prepared, and how is this affected by time? *an olive color*

It is of a bluish color at first, becoming darker by age.

What are its uses and modes of application?

is used by rubbing it on the skin
It is used to discuss buboes, and chronic, glandular swellings, applied in the course of the absorbents, which pass through the affected gland, and to produce the specific effects of mercury, applied as before directed. *cannot be used internally*

2. *Mercurial Plaster—Emplastrum Hydrargyri.* What are the constituents of this plaster, and what is the mode of preparing it?

It consists of mercury, olive oil, resin and lead plaster. The oil and resin are melted, and when cool, are rubbed with the mercury, till the globules disappear; the melted lead plaster is then added and mixed.

What are its uses?

It is applied as a discutient to venereal buboes, nodes, &c. *when you wish to make a slight suppuration, and keep it up for some time*

- used to prevent the maturation of small pimple nodes -

3. *Mercurial Pills*—*Pilulæ Hydrargyri*. How are these prepared, and what are they commonly called?

Prepared by rubbing mercury with the confection of roses, till all the globules disappear, and then adding powdered liquorice root, and beating the whole into a mass. In this state it is kept in the shops, and is called *blue mass*, when made into pills, *blue pills*. *looks like mercurial*

How much of the mass does the officinal pill contain, and what proportion of mercury?

Three grains of the mass constitute a pill; which contains one grain of mercury.

What are the relative virtues of this preparation?

It is one of the mildest mercurials, much used to produce the alterative and sialagogue effects of mercury.

What is the dose?

As an alterative, 1 pill every night or two; as a sialagogue, 1 pill, 3 times a day.

4. *Mercury with chalk*—*Hydrargyrum cum creta*. How is this prepared, and what are its medical properties and uses? *a bluish white powder*

Prepared by rubbing purified mercury with prepared chalk, till its globules are extinguished. It possesses the properties of a mild mercurial and antacid. Well adapted for diseases of children, attended with deficient secretion of bile, indicated by clay-colored stools, and in cases of diarrhœa, with acidity of the primæ viæ.

What is the dose?

For an infant, from 2 to 5 grains; and for an adult, from 5 to 30. *3 or 4*

2. Oxides.

What are the officinal oxides? *protoxide*

The black oxide, and the red oxide.

1. *Black Oxide of Mercury*—*Hydrargyri Oxidum Nigrum*. How is this prepared?

It is prepared by agitating the mild chloride of mer-

cury, (calomel,) with a solution of potassa, and the black oxide, which precipitates on standing, is washed with distilled water, and dried with a gentle heat.

What are its physical and chemical properties?

It is in the form of a black powder, at first, changing to olive, on exposure to light, and is without odor or taste. It is the protoxide, consisting of 1 eq. of mercury, and 1 of oxygen, but on exposure to light, a portion of it is resolved into the peroxide and metallic mercury.

What is its character and dose?

bono & a
effecient
calomel - It produces the usual effects of the mercurials, but owing to its varying composition, and the difficulty of preserving it unchanged, it is but little employed internally; sometimes applied externally, in the form of an ointment. It is the active ingredient of *black wash*, (Hydrarg. chlorid. mit., 3 ss., liquor calcis, Oss.,) which is much used as a wash for venereal sores. Dose, as a sialagogue, is from 1 to 3 grains, 2 or 3 times a day.

2. *Red Oxide of Mercury—Hydrargyri Oxidum Rubrum.* What is this commonly called, and how is it prepared?

Commonly called *red precipitate*. Prepared by dissolving mercury with a gentle heat, in diluted nitric acid, and evaporating it to dryness. The mass is then rubbed into powder and heated in a shallow vessel, till red vapors cease to arise. The mercury is oxidized at the expense of the nitric acid, which escapes in the form of nitric oxide gas.

What is its form, color, solubility and chemical nature?

When properly prepared, it is in brilliant red scales, with an orange tint, is but slightly soluble in water, and is the peroxide of mercury, containing usually, a small proportion of nitric acid.

What are its uses and modes of application?

On account of the harshness and uncertainty of its action, it is rarely given internally; employed exter-

nally as a local stimulant and escharotic. In the state of powder, it is sometimes sprinkled over the surface of chancres and indolent and fungus ulcers. It forms the active part of *yellow wash*, (Hydrarg. chlorid. corrosiv. gr. xv liquor calcis, Oss.,) which is much used in venereal sores. In the form of the officinal ointment, (*Unguentum Hydrargyri Oxidi Rubri*,) it is much used as a stimulant application to syphilitic and indolent ulcers; to porrigo of the scalp; to ophthalmia tarsi, &c. is orange at first but becomes olive -

3. Chlorides.

What are the two chlorides of mercury?

The mild chloride and the corrosive chloride.

1. *Mild Chloride of Mercury*.—*Hydrargyri Chloridum Mite*. By what other names is this preparation called, and what is it chemically?

Commonly called *calomel*, sometimes *submuriate of mercury*. This, however, is incorrect, as it is the *protochloride of mercury*.

How is it prepared?

A bipersulphate of mercury is first formed by boiling two pounds of purified mercury in three pounds of sulphuric acid, until the salt is left dry. This, when cold, is rubbed with two additional pounds of mercury, and then with a pound and a half of chloride of sodium, (common salt,) until all the globules disappear. The mild chloride is now sublimed, and afterwards reduced to powder and washed with boiling distilled water till this affords no precipitate upon the addition of water of ammonia, an evidence that it is free from corrosive sublimate, which is apt to be present. Howard's or Jewell's calomel, is prepared by causing it, in the state of vapor, to come in contact with steam in the subliming vessel, by which it is freed from corrosive sublimate, and condensed in the form of an impalpable powder.

What are its properties, as kept in the shops?

It is in the form of a fine powder, devoid of odor

and taste, and of a light buff color, becoming darker by exposure to light. Its sp. gr. is 7.2. That which is condensed in steam is perfectly white, and is lighter than common calomel, in the proportion of three to five.

What are its relations to water and alcohol, and its incompatibles?

It is insoluble in water and alcohol, and is incompatible with the alkalies, the alkaline earths and alkaline carbonates, soaps, &c. *hyd chlorides* lead

What is the relative value of calomel as a mercurial, and its dose?

It is the most valuable and most extensively employed of all the mercurial preparations. The dose, as an alterative, is from gr. $\frac{1}{2}$ to gr. j., every night or every other night; as a sialagogue, the same quantity, repeated 3 times a day.

2. *Corrosive Chloride of Mercury.*—*Hydrargyri Chloridum Corrosivum.* What is this commonly called?

Corrosive sublimate.

How is it prepared, and what is its chemical nature?

The mode of preparation is the same as that of the mild chloride, only that the mercury is omitted in the second place. Hence, from the double decomposition which occurs, the *bichloride of mercury* and sulphate of soda result; the former sublimes and the latter remains behind.

What are its physical properties? *from*

It is in white, semi-transparent, crystalline masses, which are pulverized for use. It is inodorous, but has an intensely acrid, disagreeable taste. Sp. gr. 5.2.

What are its relations to water and alcohol, and its incompatibles? 16

It is soluble in 18 or 20 parts of cold, and in 3 parts of boiling water, and in $2\frac{1}{3}$ parts of alcohol. The incompatibles are numerous: the alkalies and their carbonates; soap; lime-water; many metals and metallic

-if the way corrosive sublimate we
the calomel test it with aqua ammonia
which will throw down a white precipitate

- acetates of lead, tartar emetic, ...
all hydrochlorates, infusions of ...
catechu oak bark & anemone ...
house radish -

salts, and some vegetable and animal substances, decompose it.

What is its character as a sialagogue, and as a poison?

Though the most powerful of the mercurials, it is least apt to salivate. In over doses, it is a violent corrosive poison.

What are its internal uses?

It is used in syphilis, and in some obstinate cutaneous affections.

What is its dose and its antidote?

Dose, from $\frac{1}{8}$ to $\frac{1}{4}$ of a grain, 3 times daily, in pill or solution. Antidote, albumen, as found in eggs, or gluten, in wheat flour. 1 egg for every four gr.

4. Salts.

1. Yellow Sulphate of Mercury.—*Hydrargyri Sulphas Flavus*. What is this commonly called?

Turpeth Mineral.

How is it prepared, and what is its chemical nature?

The bisulphate of the peroxide of mercury, obtained as in the preparation of the chloride and bichloride, is rubbed into powder and thrown into boiling water, and the yellow precipitated powder repeatedly washed with hot water, and then dried. It consists of 1 eq. of sulphuric acid, and $1\frac{1}{4}$ of peroxide, and is therefore a subsesquisulphate.

What is its form, color and taste?

It is in the form of a powder, of a lemon-yellow color, and has a somewhat acid taste.

What are its medical properties and uses?

It is alterative, emetic, and errhine. But little used for the two former purposes; sometimes as an errhine, diluted with 5 parts of starch or powdered liquorice root.

What is the dose?

As an alterative, 1 grain; as an emetic, from 2 to 5 grains.

... particularly for syphilis

2. *Ammoniated Mercury*.—*Hydrargyrum Ammoniatum*. What is the common name?

White precipitate.

How is it prepared, and what is its chemical composition?

Muriate of ammonia and corrosive sublimate are dissolved in distilled water, and solution of carbonate of potassa added, when the white precipitate subsides and is washed till tasteless, and dried. It consists of 1 eq. of peroxide of mercury, and 1 eq. of muriate of ammonia.

What are its physical properties? *Chemical nature not entering.*

It is in the form of a light, white, insoluble powder, with an earthy taste. *active and metallic*

What are its remedial uses?

7. to 3. of am. p. It is employed only externally in the form of ointment (*Unguentum Hydrargyri Ammoniatum*), in cutaneous eruptions, such as porrigo, psora, and herpes.

3. *Nitrate of Mercury*. In what form is this official?

In the form of ointment—*Unguentum Hydrargyri Nitratis*.

How is this prepared, and what is it commonly called?

Mercury is dissolved in nitric acid and then incorporated with a melted mixture of lard and neatsfoot oil. It is commonly called *citrine ointment*.

What is its color? *Chemical changes not here used.*

When freshly prepared, it is of a beautiful golden-yellow color, acquiring a greenish hue by time.

What are its therapeutical applications?

It is used as a stimulant and alterative application in ophthalmia tarsi and in various ulcerative and eruptive diseases; as porrigo, impetigo, lupus, herpes, psoriasis, &c. Usually diluted with lard.

5. *Sulphurets*.

What are the two sulphurets of mercury, and their uses?

The *red sulphuret of mercury*, commonly called *cinnabar*, and in the powdered state *vermillion*; and the *black sulphuret of mercury*, sometimes called *Ethiops mineral*. They are sometimes employed in the way of fumigation, where a speedy mercurial impression is desired, half a drachm or so being thrown upon a hot plate and the fumes inhaled as they arise.

4 6. Iodides.

What are these and their remedial uses?

The *Iodide* or *Protiodide*, and the *Binioidide* or *Red Iodide of Mercury*, are occasionally used in scrofulous and syphilitic affections, and in the form of ointment in scrofulo-venereal ulcers and glandular swellings, &c.

What are their doses?

Of the protiodide, 1 grain, gradually increased to 3 or 4; of the binioidide, $\frac{1}{16}$ of a grain, gradually increased to $\frac{1}{4}$.

IODINE.—IODINUM.

From what is this obtained, and what are its physical and chemical properties?

It is obtained chiefly from *kelp*, or the ashes of sea-weeds. It is met with in crystalline scales of a bluish-black color with a metallic lustre. It has a strong odor resembling that of a chlorine and a very acrid taste. Its sp. gr. is a little less than 5. It is an elementary substance, existing in combination in both kingdoms of nature. It is soluble in alcohol and ether, and in a large proportion of water. When heated it melts, and is volatilized in purple vapor, whence its name, but the best characteristic of it is, the blue compound which it forms with starch.

What are its therapeutical effects and applications?

Given in small doses, it acts as a general excitant, increases the appetite, promotes absorption, and aug-

ments the secretions. Its long continued use has produced, in some instances, great nervous derangement, with impaired digestion, emaciation and hectic symptoms. In over doses it acts as a corrosive poison. It has been used in a great variety of diseases, but principally in those of the absorbent and glandular systems. In scrofula, bronchocele, and other glandular enlargements, it has proved eminently successful.

What is the dose and mode of administration?

Dose, from $\frac{1}{4}$ to $\frac{1}{2}$ of a grain, 3 times a day, and gradually increased to 1 grain. Best given in an aqueous solution of iodide of potassium, never in powder. Given also in tincture—*Tinctura Iodini*, which is made in the proportion of \mathfrak{z} ss. of iodine to Oss. of alcohol, and given in the dose of 10 to 20 drops, mixed with sweetened water.

What are the objections to the tincture.

The iodine is liable to be converted into hydriodic acid, by uniting with the hydrogen of the alcohol when long kept, and when carelessly kept is apt to be deposited in the crystalline form, from the evaporation of the alcohol; hence it should be prepared in small quantities at a time, and preserved in well-stopped bottles.

How is iodine applied externally?

In the form of bath and ointment.

What is the strength of the latter, and its effects on the skin?

It contains \mathfrak{g} j. of iodine to \mathfrak{z} j. of lard. It imparts an orange color to the skin, which gradually disappears with the evaporation of the iodine. It occasionally produces a pustular eruption by repeated application.

Iodide of Potassium—*Potassii Iodidum*. What are the properties and uses of this?

It crystalizes in white, opaque cubes, which deliquesce on exposure, has a pungent saline taste, and is soluble in water and alcohol. Its solution is capable of dissolving a large quantity of iodine, and is

therefore its best vehicle. In medical properties it is analogous to iodine, but is weaker.

What is *Lugol's solution*, and the dose?

It consists of ℥j. of iodine, ℥ij. of iodide of potassium, and f ʒ vij. of water. Dose, 6 drops twice a day, and gradually increased. Dose of the iodide of potassium, 1 to 2 grains.

XXIII. ANTACIDS.

What are these and their uses?

They are substances which, from their properties of combining with and neutralizing acids, are given to correct acidity in the *primæ viæ* and urine.

What are the substances used as antacids?

The alkalies, alkaline earths, and their carbonates.

AMMONIA.

What is its character as an antacid, and to what cases is it applicable?

It is a stimulant antacid, applicable to cases of atonic gout and dyspepsia, attend with acidity.

How is it employed?

In the form of the officinal aqueous or alcoholic solution—*Aqua Ammoniæ* and *Alcohol Ammoniatum*. The *aromatic ammoniated alcohol*, frequently called *aromatic spirit of ammonia*, is sometimes given in flatulent colic, nervous weakness, &c.

What is the dose of each of these preparations?

Of *solution of ammonia*, from 5 to 20 drops; of *ammoniated alcohol* and *aromatic ammoniated alcohol*,^x from 20 to 60 drops, each to be given in a wine-glassful of water. The *carbonate of ammonia* sometimes given also as an antacid in atonic dyspepsia.

^x *aromatic ammoniated added to alcohol ammoniatum*—

MAGNESIA.

What is the character of magnesia as an antacid, and what are its particular applications as such?

It is an excellent antacid, much used in dyspepsia, sick headache, gout, and other diseases associated with acidity of the stomach, and constipation of the bowels. Used also in gravel, with excessive secretion of uric acid.

What is the dose?

As an antacid from 10 to 30 grains.

What is the character and dose of the carbonate of magnesia as an antacid?

It is very useful in some cases of sick stomach, attended with acidity, but is objectionable in most cases on account of its tendency to produce flatulence, by the extrication of its carbonic acid. Dose, 3 ss. to 3 j.

LIME.—CALX.

How is lime used internally.

In solution under the name of *Lime-water*—*Liquor Calcis*.

How is this prepared and kept?

Prepared by pouring a gallon of water on four ounces of *quickslime*, and the solution, together with the undissolved lime, is kept in stopped glass bottles.

What are its sensible properties, and the effects of exposure to the air?

Lime-water is colorless and odorless, but has a disagreeable alkaline taste. Exposed to the air it attracts carbonic acid and becomes converted into the insoluble carbonate.

What are its medical properties and uses?

It is antacid and astringent, much used in dyspepsia, with acidity and irritability of stomach; in diarrhoea, diabetis, and excessive secretion of uric acid. Mixed with an equal quantity of milk, which completely covers its taste; it is a very efficient remedy

for nausea and vomiting, dependent on irritability of stomach; and a diet exclusively of lime-water and milk, in the proportion of one part of the former to two or three of the latter, is found to be a very effectual plan of treatment in dyspepsia accompanied with vomiting of food. Used externally as a wash to flabby ulcers, and to chronic eruptions, as tinea capitis and scabies; as an injection in leucorrhœa, and ulceration of the bladder or urethra, and mixed with linseed or olive oil, as a liniment in burns and scalds.

What is the dose?

From $f \text{ } \frac{3}{ij}$. to $f \text{ } \frac{3}{iv}$., several times a day. To allay nausea, a table-spoonful, each of lime-water and new milk, every twenty or thirty minutes.

Carbonate of lime. How is this used?

In the form of *prepared chalk*—*Creta Præparata*—and *prepared oyster shell*—*Testa Præparata*.

How is the former prepared?

Chalk is prepared for use by levigation and elutriation, and the soft mass which remains after decanting the clear liquor, is dropped in small portions, on an absorbent surface, and dried in the shape of small cones.

What are its sensible properties, and its relations to water?

It is inodorous and tasteless, and is insoluble in pure water, slightly soluble in carbonic acid water.

What are its medical properties, and therapeutical applications?

It is antacid and slightly astringent; much used in diarrhœa, accompanied with acidity.

How is it given, and what is the dose?

Given in powder, or in mixture—*Mistura Cretæ*. This consists of prepared chalk $\frac{3}{ss}$., sugar and powdered gum arabic, each $\frac{3}{ij}$., cinnamon water and water $f \text{ } \frac{3}{iv}$. Dose of the powder, from 10 to 30 grains; of the mixture, $f \text{ } \frac{3}{ss}$. to $f \text{ } \frac{3}{ij}$.

How are oyster-shells prepared?

They are freed from extraneous matter, washed with

boiling water, and then reduced to powder in the same manner as prepared chalk.

How does it differ from this?

Prepared oyster-shell, is carbonate of lime, differing from chalk in being intimately associated with animal matter, which is thought by some, to render it more acceptable to the stomach.

What is the dose?

From 10 to 30 grains, or the same as that of prepared chalk.

CARBONATES OF POTASSA.

What is the dose of these as antacids?

Dose of the carbonate, from 10 to 30 grains; of the bicarbonate, 20 grains to \mathfrak{z} j.

How is the *alkaline infusion* of hickory ashes and soot prepared, and what is its chemical nature, and its dose?

Prepared by digesting a quart of clean hickory ashes and half a pint of soot, in a gallon of hot water, for 24 hours, and decanting the clear liquor. It is an impure solution of the carbonate of potassa. Dose, \mathfrak{f} \mathfrak{z} j., or \mathfrak{f} \mathfrak{z} ij.

CARBONATES OF SODA.

1. *Carbonate of Soda.* What are the sources of this?

It is sometimes prepared by solution and crystalization, from *barilla*, or *kelp*, impure carbonates of soda, obtained by burning certain marine plants, but usually, from sulphate of soda, or chloride of sodium, on a large scale.

What are its properties?

It is a white salt, crystalizing in large rhomboidal prisms. It contains nearly two-thirds of its weight of water of crystalization, which it parts with by exposure to the air, and hence, is of variable strength, as found in the shops. It has an alkaline taste and re-action, and is very soluble in water. *60 grains*

What is the dose of the crystalized and anhydrous salt?

Dose of the former, from 30 to 60 grains; of the latter, which is preferable, from 10 to 30 grains.

2. *Bicarbonate of Soda*. How is this prepared, and what is its chemical nature, as found in the shops?

It is prepared by passing carbonic acid through a solution of carbonate of soda, until it is fully saturated, and then crystalizing it by a gentle heat. As it exists in the shops, it is considered to be a mixture of the bicarbonate and carbonate, and is sometimes called super-carbonate of soda.

What is its color and taste, and its relation to water?

It is of a white color, has a mild alkaline taste, and is soluble in 13 times its weight of cold water. Boiling water dissolves it more readily, but with the disengagement of a portion of its carbonic acid.

What are its advantages as an antacid and antilithic?

It is preferable to the carbonate on account of its greater acceptability to the palate and stomach, and to the bicarbonate of potassa, on account of its greater neutralizing power, the eq. of soda being smaller than that of potassa.

What is the dose, and best mode of administration?

Dose, from 3 ss. to 3 j., taken in a glass of carbonic acid water, to which a little ginger syrup may be added.

XXIV. ANTHELMINTICS.

What are these?

Substances, which by poisoning or debilitating worms in the alimentary canal, favor their expulsion.

What is their *modus operandi*?

Some act by a poisonous influence on the worms, others by a mechanical one.

What are the particular anthelmintics?

Pink-root, azedarach, worm-seed, cowhage, male fern, bark of pomegranate root, oil of turpentine, tin, &c.

PINK-ROOT.—SPIGELIA.—

What is this officinally?

The root of the *Spigelia Marilandica* or *Carolina Pink*, an herbaceous plant, indigenous in the southern states, flowering from May to July.

What are its physical properties?

It consists of numerous small, crooked, wrinkled fibres, of a yellowish-brown color, attached to a knotty head. It has a faint odor, and a sweetish, slightly bitter taste.

What are its relations to water and alcohol, and the effects of exposure?

Water and alcohol extract its virtues, which are somewhat impaired by age and exposure.

What are its effects on the system, and on the worms?

In the ordinary dose, it produces little apparent effect on the system, in larger ones, it sometimes operates as a cathartic, and in over doses it produces narcotic symptoms. These less apt to occur, when it acts on the bowels. It is one of the most efficient anthelmintics, supposed to act by a direct poisonous influence upon the worms.

What are the modes of administration?

It is given in powder, sometimes combined with calomel; and in infusion, often associated with senna, to ensure its action on the bowels.

What is the dose?

Of the powder, for a child a few years old, from 10 to 20 grains; for an adult, ʒj. or ʒij., repeated morning and night, for several successive days, and then followed by a brisk cathartic. Dose of the infusion, made with ʒss. of the root, to Oj. of water, to which ʒss. of senna is usually added, from f ʒss. to f ʒj., for a child, repeated 2 or 3 times a day.

-brake root had a strong aromatic odor and a bitter taste.

AZEDARACH.—AZEDARACH.

What is this officinally?

The bark of the root of the *Melia Azedarach*, or *Pride of China*, &c., a native of oriental countries, and naturalized in our Southern States.

What are its effects on the system?

It is cathartic and emetic, and, in large doses, narcotic.

What is its character as an anthelmintic, and the mode of exhibition and dose?

It is considered to be a very efficient anthelmintic in the South, where it is chiefly employed. Used in decoction made by boiling Oij. of water with ℥ iv. of the fresh bark to Oj., and given in the dose of f ℥ ss. to a child, every 2 or 3 hours, till it operates on the bowels, or twice a day for several days, and then followed by a cathartic.

WORMSEED.—CHENOPODIUM.

What is this?

The seeds of the *Chenopodium anthelminticum*, or *Jerusalem oak*, an indigenous, herbaceous plant.

What are their physical and chemical properties?

They are small, roundish, light; of a greenish-yellow color, and, when deprived of their capsular covering, of a dark shining appearance. They have a bitter, pungent taste, and a strong, peculiar odor, which is possessed by the whole plant. Their virtues reside in a volatile oil, which is officinal under the name of *Oleum Chenopodii*.

How is this prepared, and what is its color?

Obtained by distillation with water. It is of a bright yellow color, when freshly distilled, becoming deeper and darker by age.

What is the dose of the seeds and of the oil?

For a child, ℥ j. or ℥ ij., of the powdered seeds, and from 4 to 8 drops of the oil, once or twice a day for several days, and then followed by a cathartic.

COWHAGE.—MUCUNA.

What is this officinally ?

The bristles of the pods of *Mucuna pruriens*, *Dolichos pruriens*, or *Cowitch*, a climbing West India shrub.

What is the character of the pods or legumes ?

They are about four inches long, shaped like the italic *f*, and covered with brown spiculæ or hairs.

What is their mode of action ?

They act mechanically by piercing the worms, and are best adapted for the removal of the round worm.

How is it administered and what is the dose ?

Usually given in the state of electuary, prepared by dipping the pods in syrup or molasses and scraping it off with the hairs until it attains the consistence of thick honey ; the dose of which is ℥ss. for an adult, ʒj. for a child ; given for three nights successively, and then followed by a brisk cathartic.

MALE FERN.—FELIX MAS.

What is this officinally ?

The root or rhizome of the *Aspidium Felix Mas*, or *male fern*, a plant growing in the United States, from New Jersey to Virginia, and also in Europe, Asia and Africa.

What are the physical properties of the root ?

It is large, tufted and scaly, but as met with in the shops, it is usually broken up into fragments. The inner greenish part of the root-stock is the part used. When dry, it has a feeble odor, and a nauseous, bitter, somewhat acrid taste.

What are its relations to alcohol, water and ether, and the effects of time upon its virtues ?

Its virtues, which are most readily extracted by ether, are lost in two years.

What are its effects upon the system, and upon the worms ?

It produces but little sensible effect on the system, but acts as a poison to the worms, and is said to have proved very effectual in the expulsion of the tape-worm. It is seldom employed in this country.

How is it given and what is the dose ?

Given in powder and ethereal extract. Dose of the former, from ʒj. to ʒij.; of the latter, from 12 to 24 grains.

BARK OF POMEGRANATE ROOT.—GRANATI RADICIS CORTEX.

What is its character as an anthelmintic ?

It is said to be an excellent vermifuge in cases of tape-worm, but it is not often employed in this country.

What is the mode of administration, and the dose ?

Given in decoction, made by boiling ʒij. of the bark in Oij. of water to Oj., and the whole taken, by an adult, in three doses, with intervals of half an hour.

OIL OF TURPENTINE.—OLEUM TEREBINTHINÆ.

What is its character and particular application as a vermifuge ?

It is a powerful anthelmintic, particularly adapted for cases of tænia, which it destroys by a poisonous influence, and expels by its cathartic operation. Sometimes used in the form of enema, for ascarides in the rectum.

What is the dose ?

For an adult, from f ʒss. to f ʒij., followed by a dose of castor oil, if it do not operate in 2 or 3 hours. Sometimes given in small doses—4 or 5 drops—several times a day, for the stomachic worms of children.

POWDER OF TIN.—PULVIS STANNI.

How is this prepared ?

By melting tin, and stirring it while cooling until

it is reduced to a powder; after which it is passed through a sieve to separate the coarser particles.

What is its particular application, and its *modus operandi*?

It is most effectual in the expulsion of lumbrici, and appears to act mechanically; consequently, its administration should always be followed by a brisk cathartic.

What is the dose and mode of administration?

Dose for a child, from ʒj. to ʒij.; for an adult, ʒss. to ʒj.; given in molasses, for 2 or 3 successive mornings.

Finished March 13-1849-



W. H. H. H.

INDEX.

A		American senna	165
Acacia	250	Ammonia	275
Aceta	14	Ammoniæ carbonas	96
Acetate of iron	81	Ammoniac	226
Acetate of lead	38	Ammoniac plaster	227
Acetate of morphia	118	Ammoniacum	104, 226
Acetate of potassa	209	Ammoniated alcohol	275
Acetate of zinc	84	Ammoniated copper	83
Acetated tincture of opium	117	Ammoniated iron	81
Acetic acid	137	Ammoniated mercury	272
Acetum colchici	197	Ammoniated tincture of	
Acetum scillæ	223	guaiaac	217
Acidum aceticum	137	Ammoniated tincture of va-	
Acidum arseniosum	247, 263	lerian	102
Acidum benzoicum	229	Angustura	60
Acidum citricum	137	Angustura bark	60
Acidum hydrocyanicum	142	Anodynes	105
Acidum muriaticum	91	Antacids	275
Acidum nitricum	90	Anthelmintics	279
Acidum nitro-muriaticum	92	Anthemis	56
Acidum succinicum	103	Antimonial powder	134
Acidum sulphuricum	89	Antimonial wine	133, 153
Acidum sulphuricum aroma-		Antimonii et potassæ tar-	
ticum	90	tras	130, 213
Acidum sulphuricum dilutum	90	Antimonii sulphuretum præ-	
Actual cauterants	244	cipitatum	133
Æther sulphuricus	108	Antispasmodics	98
Æther sulphuricus rectifica-		Apocynum cannabinum	197
tus	108	Approximate measures	20
Alcohol	105	Aqua ammoniæ	243
Alcohol ammoniatum	275	Aqua camphoræ	123
Alcohol ammoniatum aroma-		Aqua cinnamomi	65
ticum	275	Aqua menthæ piperitæ	73
Alcohol dilutum	106	Aqua picis liquidæ	204
Allium	223	Aqua regia	93
Aloe	166, 230	Aqua rosæ	33
Aloes	166, 230	Argenti nitras	87, 246
Alterative diaphoretics	216	Aromatic ammoniated alco-	
Alum	34	hol	275
Alum curd	35	Aromatic spirit of ammonia	275
Alum cataplasm	35	Aromatic sulphuric acid	90
Alumen	34	Aromatic syrup of rhubarb	163
Alum whey	35	Aromatics	61
Alumen exsiccatum	34, 248	Arrow-root	257
Amber	102	Arsenic	262
American centaury	44	Arsenicum	262

Arsenious acid	247, 263		
Arterial sedatives	130		
Arterial stimulants	94		
Artificial musk	99		
Artificial nitre-beds	135		
Assafoetida	100, 227		
Assafoetida	100, 227		
Astringents	22		
Atropia	124		
Aurantii cortex	63		
Azedarach	281		
B			
Bacher's pills	174		
Balsam of capaiva	205		
Balsam of Peru	228		
Balsam of Tolu	227		
Bark of sassafras-root	218		
Barley	257		
Barley water	258		
Basilicon ointment	203		
Belladonna	124		
Benzoic acid	229		
Bicarbonate of potassa	208		
Bicarbonate of soda	279		
Bichloride of mercury	248, 270		
Biniodide of mercury	273		
Bismuthi subnitras	86		
Bitartrate of potassa	209, 187		
Bitters of peculiar or modified properties	46		
Bittersweet	127		
Blackberry-root	30		
Black drop	117		
Black hellebore	173, 230		
Black mustard seeds	239		
Black-oak bark	23		
Black oxide of mercury	267		
Black pepper	68		
Black snakeroot	225		
Black sulphuret of mercury	273		
Black wash	268		
Blistering plaster	236		
Blisters	236		
Blood-root	151		
Blue pills	267		
Bluestone	81		
Blue vitroil	81		
Boneset	57		
Brimstone	180		
Brucia	261		
Burgundy pitch	241		
C			
Calamine		86	
Calamus		74	
Calcined magnesia		183	
Calomel		190, 269	
Calx		276	
Camphor		122	
Camphor liniment		124	
Camphor water		123	
Camphora		122	
Camphorated soap liniment		124	
Camphorated tincture of opium		116	
Camphorated tincture of soap		124	
Canada balsam		201	
Canada turpentine		201	
Canella		65	
Cantharidin		235	
Cantharis	207, 232,	235	
Cantharis vittata		238	
Capsicin		95	
Capsicum		94, 241	
Carbonate of ammonia		96	
Carbonate of lead		37	
Carbonate of lime		277	
Carbonate of magnesia		182	
Carbonate of potassa		207	
Carbonate of soda		278	
Carbonate of zinc		85	
Cardamom		70	
Cardamomum		70	
Carminatives		63	
Carolina pink		280	
Carota		199	
Caryophyllus		65	
Cascarilla		60	
Cassia firtula,		158	
Cassia Marilandica		165	
Castor		100	
Castoreum		100	
Castor oil		159	
Cataplasma aluminis		35	
Cataplasma lini		253	
Cataplasma sinapis		240	
Cataplasmata		16	
Cataplasms		16	
Catechu		27	
Cathartics		154	
Cathartin		164	
Caustics		244	

Cayenne pepper	94, 241	Comp. infusion of cinchona	51
Cerata	15	Comp. infusion of gentian	44
Cerate of carbonate zinc	86	Comp. infusion of roses	33
Cerate of spanish flies	236	Compound mixture of iron	79
Cerate of subacetate of lead	40	Compound pills of rhubarb	169
Cerates	15	Comp. pills of squill	227
Ceratum cantharidis	236	Comp. spirit of lavender	71
Ceratum plumbi subacetatis	40	Comp. spirit of sulphuric ether	109
Ceratum resinæ	203	Comp. syrup of sarsaparilla	221
Ceratum zinci carbonatis	86	Comp. syrup of squill	225
Cerebral stimulants	105	Compound tincture of cardamom	70
Ceruse	37	Comp. tincture of cinnamon	65
Cetraria	254	Comp. tincture of Peruvian bark	51
Chalk mixture	277	Confectiones	10
Chamomile	56	Confections	10
Chenopodium	281	Confection of orange peel	63
Cherry laural water	142	Confection of roses	33
Chimaphila	32	Confection of senna	165
Chlorides of mercury	269	Confection of aurantii corticis	63
Chlorohydric acid	91	Confectio rosæ	33
Chondrus	255	Confectio sennæ	165
Cimicifuga	225	Confectio of aurantii corticis	63
Cinchona	46	Confectio rosæ	33
Cinchonia	49	Confectio sennæ	165
Cinnabar	273	Conia	128
Cinnamomum	63	Conium	128
Cinnamon	63	Conserves	11
Cinnamon water	65	Copaiba	205
Circumstances that modify the effects of medicines	6	Copperas	78
Citrate of potassa	214	Coptis	42
Citric acid	137	Cornus Florida	54
Citrine ointment	272	Corrosive chloride of mercury	248, 270
Claret wine	107	Corrosive sublimate	248, 270
Classification of medicines	20	Coxe's hive syrup,	225
Cloves	65	Cowhage	282
Clysters	17	Cranesbill	29
Codeia	113	Cream of tartar	187
Coffee	104	Creasote	204
Colchici radix	195	Creasotum	204
Colchici semen	195	Creta præparata	277
Cold cream	33	Crotonic acid	179
Colocynth	174	Croton oil	179
Colocynthis	174	Crude saltpetre	135
Columba	45	Crude sulphur	180
Columbo	45	Cubeba	68
Common caustic	245	Cubebs	68
Compound cathartic pills	177	Cupri sulphas	81, 153, 248
Compound decoction of sarsaparilla	221	Cuprum ammoniatum	83
Comp. extract of colocynth	175	Cyanuret of potassium	144

D			
Dandelion	197	Emollients	258
Daturia	126	Emplastra	16
Deadly nightshade	124	Emplastrum ammoniaci	227
Decocta	12	Emplastrum calefaciens	237
Decoction of barley	258	Emplastrum picis cum can-	
Decoction of bittersweet	127	tharide	237
Decoction of dogwood	54	Emplastrum plumbi	36
Decoction of logwood	29	Emplas. plumbi carbonatis	38
Decoction of mezereon	218	Emulsion	11
Decoction of Peruvian bark	51	Enemata	17
Decoction of pipsissewa	32	Epispastics	234
Decoction of seneka	225	Epsom salts	185
Decoction of uva ursi	32	Ergot	259
Decoctions	12	Ergota	259
Decoction chimaphilæ	32	Errhines	233
Decoction cinchonæ	51	Escharotics	244
Decoction cornus Floridæ	54	Essence of peppermint	73
Decoction dulcamaræ	127	Essential oils	61
Decoction hæmatoxyli	29	Ethiops mineral	273
Decoction hordei	258	Eupatorium perfoliatum	57
Decoction mezerei	218	Euphorbia corollata	151
Decoction sarsaparillæ com-		Euphorbia ipecacuanha	151
positum	221	Expectorants	222
Decoction senegæ	225	Extract of belladonna	125
Decoction uvæ ursi	32	Extract of black hellabore	174
Demulcents	249	Extract of butternut	166
Dewberry-root	30	Extract of gentian	44
Diachylon	37	Extract of hemlock	129
Diluents	259	Extract of henbane	120
Diluted alcohol	106	Extract of jalap	171
Diluted sulphuric acid	90	Extract of logwood	29
Diospyros	33	Extract of Peruvian bark	51
Distilled oils	61	Extract of sarsaparilla	221
Diuretics	193	Extract of thorn-apple	127
Dogwood	54	Extractum belladonnæ	125
Dover's powder	212	Extractum cinchonæ	51
Dracontium	103	Extractum colocythidis com-	
Dried alum	248	positum	175
Dulcamara	127	Extractum conii	129
E		Extractum gentianæ	44
Effervescing draught	214	Extractum glycyrrhizæ	253
Elaterin	178	Extractum hæmatoxyli	29
Elaterium	177	Extractum hellebori nigri	174
Electricity	104	Extractum hyoscyami	120
Electuaries	11	Extractum jalapæ	171
Elixir of vitriol	90	Extractum juglandis	166
Emetia	148	Extractum quassizæ	42
Emetics	145	Extractum sarsaparillæ	221
Emmenagogues	229	Extractum stramonii	127

F			
False angustura	60	Guaiacum	216, 331
Fennel seed	70	Guaiacum wood	216
Ferri acetæ	81	Gum Arabic	250
Ferri et potassæ tartras	80		H
Ferri filum	76	Iæmatoxylon	28
Ferri oxidum hydratum	80	Helleborus niger	173, 230
Ferri phosphas	81	Hemlock	128
Ferri ramenta	76	Hemlock pitch	242
Ferri squamæ	76	Henbane	119
Ferri subcarbonas	76	Henry's magnesia	183
Ferri sulphas	78	Hiera picra	169
Ferrocyanuret of iron	81	Hoffmann's anodyne liquor	109
Felix mas	282	Honeys	15
Filters	8	Hops	121
Flaxseed	252	Hordeum	257
Flaxseed oil	252	Howard's calomel	269
Fleabane	199	Humulus	121
Flowers of sulphur	181	Huxham's tincture of bark	51
Fluid extract of sarsaparilla	221	Hydrargyri chloridum corro-	
Fœniculum	70	sivum	248, 270
Forms in which medicines		Hydrargyri chloridum	
are used	7	mite	190, 269
Fowler's solution	263	Hydrargyri oxidum nigrum	267
Foxglove	139, 194	Hydrargyri oxidum rubrum	268
	G	Hydrargyri sulphas flavus	271
Galbanum	104	Hydrargyrum	263
Galla	25	Hydrargyrum ammoniatum	272
Gallic acid	23	Hydrargyrum cum creta	267
Galls	25	Hydrated oxide of iron	80
Galvanism	104	Hydrochloric acid	91
Gamboge	176	Hydrocyanic acid	142
Gambogia	176	Hyoseyama	120
Garlic	104, 223	Hyoseyamus	119
Gentian	43	Hypnotics	105
Gentiana	43		I
Geranium	29	Iceland moss	254
Gillenla	149	Impure sulphate of quinia	53
Ginger	73	Indian hemp	197
Glauber's salts,	184	Indian physic	149
Glycyrrhiza	253	Indian tobacco	149
Glycyrrhizin	253	Infusa	11
Golden sulphur of antimony	133	Infusion of cascarilla	61
Goldthread	42	Infusion of chamomile	57
Goulard's cerate	40	Infusion of columbo	46
Goulard's extract	39	Infusion of foxglove	141
Granatum	33	Infusion of Peruvian bark	51
Green vitriol	78	Infusion of quassia	42
Griffith's mixture	79	Infusion of rhubarb	163
Guaiac	216, 231	Infusion of sarsaparilla	220
		Infusion of tobacco	142
		Infusion of Virginia snakeroot	59

Infusion of wild cherry bark	56	Light wines	107
Infusions	11	Lime	276
Infusum anthemidis	57	Lime-water	276
Infusum cascarillæ	61	Linimenta	15
Infusum cinchonæ	51	Liniment of lime	252
Infusum cinchonæ compositum	51	Liniment of spanish flies	237
Infusum columbæ	46	Liniments	15
Infusum digitalis	141	Linimentum ammoniæ	243
Infusum pruni Virginianæ	56	Linimentum calcis	252
Infusum quassiæ	42	Linimentum camphoræ	124
Infusum rhei	163	Linimentum cantharidis	237
Infusum sarsaparillæ	220	Linimentum saponis camphoratum	124
Infusum serpentariæ	59	Linseed oil	252
Infusum tabaci	142	Linum	252
Iodide of iron	81	Liquor ammoniæ acetatis	214
Iodide of potassium	274	Liquor calcis	276
Iodides of mercury	273	Liquor morphiæ sulphatis	119
Iodine	273	Liquor plumbi subacetatis	39
Iodinum	273	Liquor potassæ arsenitis	263
Ipecacuanha	147, 212, 222	Liquorice	253
Ipecacuanha spurge	151	Liquorice root	253
Irish moss	255	Litharge	36
Iron	75	Lobelia	149
Iron filings	76	Logwood	28
	J	Lozenges	666
Jalap	169	Lunar caustic	87
Jalapa	169	Lupulin	121
Jamaica pepper	69	Lupulina	121
James' powder	134		M
Jewell's calomel	269	Mace	66
Juniper berries	198	Madeira wine	107
Juniperus	198	Magistery of bismuth	86
	K	Magnesia	183
Kermes mineral	133	Magnesiæ carbonas	182
Kino	26	Magnesiæ sulphas	185
Krameria	27	Male fern	282
	L	Malt liquors	108
Lac assafœtidæ	101	Manna	156
Lac sulphuris	182	Mannite	157
Lactate of iron	81	Maranta	257
Lactucarium	119	May-apple	171
Laudanum	116	Meadow saffron root	195
Lavandula	71	Meadow saffron seed	195
Lavender	71	Meconic acid	112
Lead	35	Meconin	112
Lead plaster	36	Medicated wines	13
Levigation	8	Mel scillæ compositum	225
Lichenin	254	Mentha piperita	72
		Mentha viridis	73
		Mercurial ointment	266

Mercurial pills	267	Oil of cinnamon	64
Mercurial plaster	266	Oil of cloves	66
Mercury	263	Oil of cubebs	69
Mercury with chalk	267	Oil of fennel	71
Mezcreon	217	Oil of juniper	199
Mezerium	217	Oil of lavender	71
Mellita	15	Oil of mace	67
Mild chloride of mercury	190, 269	Oil of nutmeg	67
Milk of assafetida	101	Oil of peppermint	72
Milk of sulphur	182	Oil of pimento	70
Mineral astringents	33	Oil of rosemary	72
Mineral cathartics	180	Oil of sassafras	218
Mineral emetics	152	Oil of savine	231
Mineral tonics	75	Oil of turpentine	95, 202, 241
Mistura assafœtidæ	101	Oil of valerian	102
Mistura camphoræ	123	Oil of vitriol	89
Mistura ferri composita	79	Oil of wormseed	281
Misturæ	11	Ointment of ammoniated	
Mixtures	11	mercury	272
Morphia	117	Ointment of biniodide of	
Morphiæ acetat	118	mercury	273
Moschus	98	Ointment of nitrate of	
Moxa	244	mercury	272
Mucuna	282	Ointment of protoiodide	
Muriatic acid	91	of mercury	273
Musk	98	Ointment of red oxide of	
Mustard	151, 239	mercury	269
Myristica	66	Ointment of oxide of zinc	85
Myroxylon	228	Ointment of rose-water	33
Myrrh	59	Ointment of spanish flies	237
Myrrha	59	Ointment of stramonium	127
		Ointment of sulphuric acid	90
N		Ointments	15
Narcein	112	Oleum caryophilli	66
Narcotics	105	Oleum chenopodii	281
Narcotina	113	Oleum cinnamomi	64
Nauseating diaphoretics	212	Oleum fœniculi	71
Nervous sedatives	139	Oleum juniperi	199
Nervous stimulants	98	Oleum lavanduli	71
Neutral mixture	214	Oleum lini	252
Nicotia	141	Oleum menthæ piperitæ	72
Nicotianin	141	Oleum myristicæ	67
Nitrate of potassa	135, 210, 215	Oleum pimentæ	70
Nitrate of silver	87, 246	Oleum ricini	159
Nitre	135	Oleum rosmarini	72
Nitric acid	90	Oleum sabinæ	231
Nitro-muriatic acid	92	Oleum sassafras	218
Nitrous powders	137	Oleum succini	103
Nutmeg	66	Oleum succini rectificatum	103
Nix vomica	261	Oleum terebinthinæ	95, 202, 241
		Oleum tiglii	179
Oil of amber	103		

Opium	100	Plumbi carbonas	37
Opodeldoc	124	Plumbi oxidum semivitreum	26
Orange-peel	63	Plumbum	35
Oxide of zinc	85	Plummer's pills	134
Oxymels	15	Podophyllum	171
Oxymel of squill	223	Pomegranate	33
P		Poppy capsules	111
Paramorphia	112	Port wine	107
Paregoric elixir	116	Potassa	245
Parsley root	200	Potassæ acetas	209
Parts to which medicines are		Potassæ bicarbonas	208
applied	17	Potassæ bitartras	187, 209
Pearlash	207	Potassæ citras	214
Pearl white	86	Potassæ carbonas	207
Peculiar medicines	259	Potassæ nitras	135, 210, 215
Peppermint	72	Potassæ sulphas	186
Perpetual blister	237	Potassæ tartras	188
Persimmon	33	Potash	207
Peruvian bark	46	Potato flies	238
Petroselinum	200	Potential cauterants	245
Phosphate of iron	81	Powders of aloes and ca-	
Phosphate of soda	189	nella	65, 169
Phosphorus	97	Powders of ipecacuanha	
Physiological effects of meds.	5	and opium	212
Pills	9	Powder of tin	283
Pills of aloes and assafætida	169	Powders	7
Pills of aloes and myrrh	169	Precipitated sulphur	182
Pills of copaiba	206	Precipitated sulphuret of an-	
Pilulæ	9	timony	133
Pilulæ aloes et assafætida	169	Prepared carbonate of zinc	86
Pilulæ et myrrhæ	169	Prepared chalk	277
Pilulæ catharticae compositæ	177	Prepared oyster-shell	277
Pilulæ copaibæ	206	Poof spirit	14, 106
Pilulæ hydrargyri	267	Protiodide of mercury	273
Pilulæ rhei compasitæ	169	Prunes	157
Pimenta	69	Prunum	157
Pimento	69	Prussic acid	142
Pink root	280	Pure bitters	41
Piper	68	Purging cassia	158
Piperin	68	Purgative enemata,	191
Pipsissewa	32	Pulveres	7
Pix abietis	241	Pulvis aloes et canellæ	60, 169
Pix canadensis	242	Pulvis antimonialis	134
Pix liquida	203	Pulvis ipecacuanhæ et opii	212
Plaster of carbonate of lead	38	Pulvis stanni	283
Plaster of pitch with spanish		Q	
flies	237	Quassia	41
Plasters	16	Quercitrin	24
Plumbi acetas	38	Quercitron	24
		Quercus alba	23
		Quercus tinctoria	23

Quinia	49	Sassafras radicis cortex	218
Quiniæ sulphas	51	Savine	231
Quiniæ sulphas impurus	53	Scales of iron	76
		Scammonium	172
R		Scammony	172
Rectified alcohol	106	Scilla	194, 223
Rectified oil of amber	103	Secale cornutum	259
Rectified sulphuric ether	108	Seidletz powders	189
Red oxide of mercury	268	Semivitrified oxide of lead	36
Red pepper	95	Senega	224, 231
Red precipitate	268	Senegin	225
Red roses	33	Seneka	224, 231
Red sulphuret of mercury	273	Senna	163
Refrigerant diaphoretics	214	Serpentaria	58
Refrigerants	130	Sherry wine	107
Resin	203	Sialagogues	232
Resin cerate	203	Simaruba	42
Resina	203	Sinapis	239
Rhabarbarin	162	Sinapism	240
Rhatany	27	Skunk cabbage	103
Rheum	160	Slippery-elm bark	251
Rhubarb	160	Smelling salts	97
Rochelle salts	188	Sodæ bicarbonas	279
Rosa centifolia	33	Sodæ carbonas	278
Rosa gallica	33	Sodæ et potassæ tartras	188
Rose water	33	Sodæ phosphas	189
Rosemary	72	Solanina	127
Rosemarinus	72	Soluble tartar	188
Rubefacients	239	Solution of acetate of ammonia	214
Rubus trivialis	30	Solution of arsenite of potassa	263
Rubus villosus	30	Solution of subacetate of lead	39
Rufus's pills	169	Solution of sulphate of morphia	119
S		Soporifics	105
Sabbatia	44	Spanish flies	207, 232, 235
Sabina	231	Spearmint	73
Sagapenum	104	Spigelia	280
Sago	255	Spirit of lavender	71
Salicin	54	Spirit of mindererus	115
Saline cathartics	184	Spirit of nitric ether	210, 215
Salix	54	Spirit of rosemary	72
Sal diureticus	209	Spiritus ætheris nitrici	210, 215
Sal prunelle	136	Spiritus lavandulæ	71
Saltpetre	135	Spiritus lavandulæ compositus	71
Salt of tartar	208	Spiritus mindereri	215
Sanguinarina	151	Spiritus rosmarinæ	72
Sarsaparilla	219	Spreading of plasters	16
Sarsaparillin	220	Spurred rye	259
Sassafras	218		
Sassafras medulla	218		
Sassafras pith	219		

Squill	151, 194, 232	Tannic acid	22
Stramonii folia	126	Tannin	22
Stramonii semen	126	Tapioca	256
Sternutatories	233	Tar	203
Strychnia	261	Tar ointment	204
Subcarbonate of iron	76	Tar water	204
Sublimed sulphur	181	Taraxacum	197
Subnitrate of bismuth	86	Tartar emetic	152, 222
Succinic acid	103	Tartar emetic ointment	132
Succicum	102	Tartarized antimony	152
Sudorifics	211	Tartrate of antimony and potassa	130, 213
Sugar of lead	38	Tartrate of iron and potassa	80
Sulphate of cinchonia	53	Tartrate of iron	81
Sulphate of copper	81, 153, 248	Tartrate of potassa	188
Sulphate of iron	78	Tartrate of potassa and soda	188
Sulphate of magnesia	185	Tea	104
Sulphate of morphia	118	Teneriffe wine	107
Sulphate of potassa	186	Terebinthina	200
Sulphate of quinia	51	Terebinthina canadensis	201
Sulphate of soda	184	Testa præparata	277
Sulphate of zinc	83, 153	Thebæic tincture of opium	116
Sulphur	180	The mineral acids	249
Sulphur precipitatum	182	The hot iron	244
Sulphuric acid	89	Thorn-apple leaves	126
Sulphuric ether	108	Thorn-apple seeds	126
Supertartrate of potassa	187	Thoroughwort	57
Suppositories	17	Tinctura alæ	169
Sweet flag	74	Tinctura et myrrhæ	169
Sweet spirit of nitre	210	Tinctura assafœtidæ	101
Syrup of ginger	63	Tinctura camphoræ	124
Syrup of orange peel	63	Tinctura cantharidis	207
Syrup of rhubarb	163	Tinctura capsici	95
Syrup of rhubarb and senna	163	Tinctura cardomomi com- posita	70
Syrup of squill	223	Tinctura castorei	100
Syrups	14	Tinctura catechu	27
Syrupi	14	Tinctura cinchonæ	51
Syrupus aurantii corticis	63	Tinctura cinchonæ compo- sita	51
Syrupus sarsaparillæ compo- situs	121	Tinctura cinnamomi	65
Syrupus scillæ compositus	225	Tinctura cinnamomi com- posita	65
Syrupus rhei	163	Tinctura colombæ	46
Syrupus rhei et sennæ	163	Tinctura digitalis	141
Syrupus rhei aromaticus	163	Tinctura ferri chloridi	79
		Tinctura gallæ	26
		Tinctura gentianæ compo- sita	44
		Tinctura guaiaci	217
		Tinctura guaiaci ammoniata	217

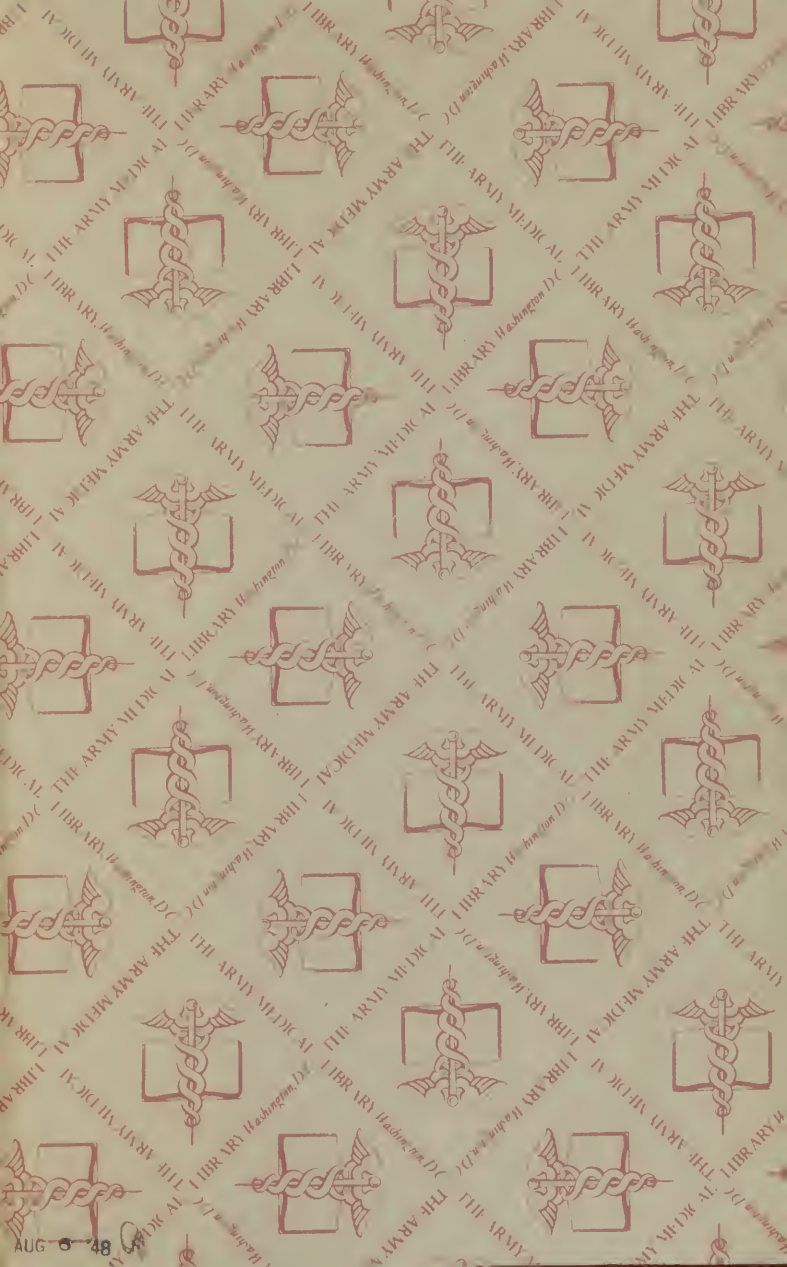
T

Tabacum	141
Table for graduating the dose of medicines	6
Tables of weights and mea- sures	19

Tinctura hellebori	174	Tincture of senna and jalap	164
Tinctura humuli	122	Tincture of spanish flies	207
Tinctura iodini	274	Tincture of squill	223
Tinctura kino	27	Tincture of stramonium	127
Tinctura kramerae	28	Tincture of tolu	228
Tinctura lupulinæ	122	Tincture of valerian	102
Tinctura lobeliæ	150	Tincture of Virginia snakeroot	59
Tinctura opii	116	Tinctures	13
Tinctura opii acetata	117	Tobaeco	141, 151
Tinctura opii camphorata	116	Tolutanum	227
Tinctura quassæ	42	Tonics	40
Tinctura rhei	163	Tormentil	33
Tinctura rhei et aloës	163	Tormentilla	33
Tinctura rhei et gentianæ	163	Tragacanth	251
Tinctura rhei et sennæ	163	Trisnitrate of bismuth	86
Tinctura sanguinariæ	152	Tragacantha	251
Tinctura sennæ at jalapa	164	Troches	10
Tinctura serpentariæ	59	Torchisci	10
Tinctura tolulani	228	Turner's eerate	86
Tinctura valerianæ	102	Turpentine	200
Tinctura valerianæ ammo- niata	102	Turpeth mineral	271
Tincturæ	13		
Tincture of aloës	169	U	
Tincture of aloes and myrrh	169	Ulmus	251
Tincture of assafetida	101	Unguenta	15
Tincture of black hellebore	174	Unguentum antimonii	132
Tincture of camphor	124	Unguentum aquæ rosæ	33
Tincture of castor	100	Unguentum cantharidis	237
Tincture of catechu	27	Unguentum hydrargyri	266
Tincture of cayenne pepper	95	Unguentum hydrargyri am- moniaci	272
Tincture of chloride of iron	79	Unguentum hydrargyri bin- iodidi	273
Tincture of cinnamon	65	Unguentum hydrargyri iodidi	273
Tincture of foxglove	141	Unguentum hydrargyri ni- tratis	272
Tincture of galls	26	Unguentum hydrargyri ox- idi rubri	269
Tincture of guaiac	217	Unguentum iodini	274
Tincture of hops	122	Unguentum picis liquidæ	104
Tincture of iodine	274	Unguentum stramonii	127
Tincture of kino	27	Unguentum zinci oxidi	85
Tincture of lobelia	150	Uva ursi	31
Tincture of lupulin	122		
Tincture of opium	116	V	
Tincture of Peruvian bark	51	Valerian	101
Tincture of quassia	42	Valeriana	101
Tincture of rhatany	28	Valerianic acid	102
Tincture of rhubarb	163	Vallet's ferruginous pills	77
Tincture of rhubarb and aloës	163	Vegetable acids	137
Tincture of rhubarb and gentian	163	Vegetable astringents	23
Tinet. of rhubarb and senna	163	Vegetable cathartics	156

Vegetable emetica	147	White lead	37
Vegetable tonics	41	White mustard seeds	239
Vermillion	278	White-oak bark	23
Vesicants	234	White bismuth	86
Vesicatories	234	White pepper	68
Vinegar of colchicum	197	White precipitate	272
Vinegar of squill	223	White turpentine	201
Vina medicata	13	White vitriol	83
Vinegars	14	Wild carrot	199
Vinum aloes	169	Wild cherry bark	55
Vinum antimonii	133	Willow	54
Vinum colchici radices	197	Wines	107
Vinum colchici semen	197	Wine of aloes	169
Vinum ipecacuanhæ	148	Wine of ipecacuanha	148
Virginia snakeroot	58	Wine of colchicum root	197
Volatile liniment	243	Wine of colchicum seed	197
Volatile oils	61	Wine-whey	108
		Wormseed	281
W		Z	
Warming plaster	237	Zinci acetas	84
Warner's gout cordial	163	Zinci carbonas	85
Washed sulphur	181	Zinci carbonas præparatus	86
Water of ammonia	243, 275	Zinci oxidum	85
Weights and measures used	19	Zinci sulphas	83, 153
White arsenic	247	Zingiber	73





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